THE
ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX.

Report of Proceedings

of the

THIRD CONFERENCE

held at

Balliol College, Oxford,

September 24th—27th, 1926.

OBJECT OF THE ASSOCIATION :—

To facilitate the co-ordination and systematic use of sources of information in science, industry, commerce, public affairs, &c.

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KEY TO PHOTOGRAPH OF VISITORS ATTENDING THE CONFERENCE, TAKEN ON THE STEPS OF BALLIOL COLLEGE HALL, SEPTEMBER 25TH, 1926.

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LIST OF VISITORS TO THE THIRD CONFERENCE.

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1 Mrs. R. J. Adam.	National Society for the Prevention of Cruelty to Children.
2 Miss M. K. E. Allen, B. Com. Sc.	Linen Industry Research Association, Lambeg, Co. Antrim.
3 J. A. C. Atkins.	English-Speaking Union (Page Memorial Library).
4 J. Bailey.	Museums Association.
5 E. A. Baker, M.A., D.Lit.	London University School of Librarianship.
6 Miss F. M. Baker, B.A.	Agricultural Economics Research Institute, Oxford.
7 Miss H. A. Ball.	International Standard Electric Corporation.
8 W. Barbour, M.A., B.Sc.	Nobel's Explosives Co., Ltd., Ardeer.
9 A. R. Barnes.	Messrs. George Philip & Son, Ltd.
10 Miss E. Bartlett.	
11 G. F. Barwick, B.A.	Association of Special Libraries and Information Bureaux.
12 L. E. Bird.	International Research Bureau.
13 Miss I. Blackwell.	Trades Union Congress General Council.
14 W. Bonser, B.A.	(a) Medical Sciences Library, University College, London. (b) Folk-Lore Society.
15 F. B. Bourdillon.	Royal Institute of International Affairs.
16 Miss E. M. Breese, F.L.A.	National Museum of Wales, Cardiff.
17 S. Brooks.	
18 F. Bullock, LL.B., F.C.I.S.	Royal College of Veterinary Surgeons.
19 The Rt. Hon. The Viscount Burnham, M.A., C.H., LL.D.	
20 M. C. Butler, L.R.A.M.	British Esperanto Association (Incorporated).
21 R. F. Cholmeley.	
22 Miss V. R. Clayton.	British Drama League
23 F. W. Clifford, F.L.A.	Chemical Society.
24 Percy Cohen.	Conservative and Unionist Central Office.
25 W. C. Coles.	Messrs. James Pascall, Ltd.
26 Mrs. Cook.	Independent Labour Party: Information Committee.
27 W. A. Cooke, B.Sc. (Econ.).	Business Research Association of Great Britain.
28 W. L. Cooper, M.A.	Bristol University.
29 H. Cross, F.L.A.	Association of Assistant Librarians.
30 Miss D. C. Crowhurst.	Rural Industries Bureau.
31 Counc. Wm. Davy, J.P.	Manchester Public Libraries.
32 T. R. Dawson, M.Sc., F.I.C.	Research Association of British Rubber and Tyre Manufacturers, Croydon.
33 W. H. Dawson.	Universities Bureau of the British Empire.
34 Miss E. Diamond, A.T.C.L.	Ilford Public Library.
35 Miss L. B. Dibben.	Ministry of Labour.
36 Miss M. M. Durham.	Woodall-Duckham Companies.
37 J. Elsden, D.Sc., F.G.S.	(a) *The Colliery Guardian.* (b) *Water and Water Engineering.* (c) *The Quarry.*

38 Miss B. Farmery.	Ilford Public Library.
39 Miss M. E. Ferguson.	
40 Miss E. K. Flitton.	Association of Special Libraries and Information Bureaux.
41 Mrs. Leila B. Flower, O.B.E.	*Christian Science Monitor.*
42 H. O. Frind, F.R.G.S.	
43 Lt.-Colonel A. T. Gage, C.I.E., M.A., B.Sc., M.B., F.L.S.	Linnean Society of London.
44 H. V. Garrett,	Messrs. Rowntree & Co., Ltd., York.
45 L. Gaster, F.J.I.	(a) Circle of Scientific, Technical and Trade Journalists. (b) Illuminating Engineering Society. (c) British Section, International Association of Journalists. (d) National "Safety First" Association.
46 L. D. Goldsmith, B.Sc., F.I.C.	General Electric Co., Ltd. (Research Dept.), Wembley.
47 A. Gomme.	H.M. Patent Office.
48 Miss S. E. S. Green.	Messrs. J. Lyons & Co., Ltd. (Research Laboratory).
49 Sir Richard Gregory, D.Sc., F.Inst.P., F.R.A.S.	British Science Guild.
50 H. Greenwell, F.S.S., Assoc.M.I.M.E.	(a) *The Colliery Guardian.* (b) *Water and Water Engineering.* (c) *The Quarry.*
51 W. T. Griffiths.	Mond Nickel Co., Ltd.
52 Miss G. Guiney.	Imperial Forestry Institute, Oxford.
53 Miss H. F. Harmer.	Venesta Ltd.
54 B. M. Headicar, F.R.S.A.	London School of Economics and Political Science.
55 Miss C. Henderson.	Research Association of British Rubber and Tyre Manufacturers, Croydon.
56 Miss W. Hill.	Royal Colonial Institute Library.
57 F. A. Hoare.	National Union of Teachers.
58 L. Honeyburn.	Nobel Industries Ltd.
59 W. Hubball.	*Manchester Guardian Commercial.*
60 Principal J. F. Hudson, M.A., B.Sc.	(a) Huddersfield Technical College. (b) Association of Technical Institutions.
61 Miss D. W. Hughes.	(a) Career Advisory Bureau. (b) Messrs. Truman & Knightley, Ltd.
62 R. S. Hutton, D.Sc.	British Non-Ferrous Metals Research Association, Birmingham.
63 Mrs. R. S. Hutton.	
64 A. B. Hyslop.	Carnegie United Kingdom Trust, Dunfermline.
65 Miss E. M. Irby.	Union of Post Office Workers.
66 Miss P. M. Isaacs.	
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74 Miss F. Lampard.	
75 Miss A. L. Lawrence, M.B.E., M.A., LL.B.	British Medical Association.
76 A. D. Lindsay, C.B.E., M.A. (Master of Balliol College).	Workers' Educational Association.
77 E. E. Lowe, Ph.D., B.Sc.	(a) Leicester Public Libraries, Museum and Art Gallery (b) North Midland Library Association.

78 Miss L. W. Mackintosh.	Oxfordshire County Library.
79 Miss Florence E. Marks.	Horace Plunkett Foundation (Co-operative Reference Library).
80 Edward A. Martin, F.G.S.	Croydon Public Libraries Committee.
81 R. Borlase Matthews, Wh.Ex., A.M.I.C.E., M.I.E.E., F.R.Ae.S.	Consulting Electrical Engineer.
82 Miss C. Mitchell.	Trades Union Congress and Labour Party (Joint Library).
83 S. A. J. Moorat, B.A.Oxon.	
84 R. O. Morris.	Ministry of Health.
85 Brig.-General Magnus Mowat, C.B.E., M.Inst.C.E., M.I.Mech.E.	(a) Institution of Mechanical Engineers. (b) Association of Technical Institutions.
86 Sir Frederic Nathan, K.B.E.	Department of Scientific and Industrial Research.
87 F. K. Neath, B.Sc.	British Cast Iron Research Association Birmingham.
88 R. H. New.	(a) Clarendon Press, Oxford. (b) National Book Council
89 Lt.-Col. L. Newcombe.	(a) Library Association. (b) University College, London. (c) Central Library for Students. (d) Education Guild of Great Britain and Ireland.
90 Mrs. Newcombe.	
91 S. J. Nightingale.	Metropolitan-Vickers Electrical Co., Ltd., Manchester.
92 Miss J. E. Norton.	London Society for Women's Service.
93 Miss R. E. Omash.	Conservative and Unionist Central Office.
94 G. H. Palmer, B.A., F.S.A.	
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100 H. E. Potts, M.Sc.	Convocation of the University of Liverpool.
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103 A. F. Ridley, F.L.A.	British Non-Ferrous Metals Research Association, Birmingham.
104 Ernest I. Robson, M.A.	Institute of Agricultural Engineering, Oxford.
105 H. Rogers.	(a) Institution of the Rubber Industry. (b) Messrs. James Lyne, Hancock Ltd.
106 H. Rotténburg. M.A., M.I.E.E.	(a) Engineering Laboratory, Cambridge University. (b) London Instrument Co., Ltd., Cambridge.
107 Prof. F. E. Sandbach, M.A., Ph.D.	(a) Association of University Teachers. (b) Joint Standing Committee on Library Co-operation.
108 C. R. Sanderson.	(a) Library Association. (b) National Liberal Club.
109 Miss M. M. Savill.	Fine Cotton Spinners' and Doublers' Association, Ltd. (Experimental Dept.), Macclesfield.

110 W. C. Berwick Sayers, F.L.A.	Croydon Public Libraries Committee.
111 Miss G. Searight, B.A.	League of Nations Union.
112 Major E. L. Sellars.	Messrs. Brunner, Mond & Co., Ltd., Northwich.
113 Mrs. G. G. Sellick.	Association of Special Libraries and Information Bureaux.
114 R. L. Sheppard.	Bureau of Hygiene and Tropical Diseases.
115 Lieut-Commander F. L. Shipman, O.B.E.	Department of Scientific and Industrial Research.
116 Miss D. F. Shuckburgh.	
117 B. H. Soulsby, M.A.,	British Museum (Natural History).
118 C. A. Spencer, M.Sc.	Department of Scientific and Industrial Research.
119 Foster Sproxton.	British Xylonite Co., Ltd., Manningtree.
120 Miss C. Stenhouse.	
121 Miss E. Stiff.	Royal Institute of International Affairs.
122 J. C. Stobart.	British Broadcasting Co., Ltd.
123 Miss P. Strachey.	(a) London Society for Women's Service. (b) National Union of Societies for Equal Citizenship.
124 W. B. Thorne, F.L.A.	
125 O. Thyregod, M.A.	Special Libraries Association (of Denmark).
126 P. K. Turner, A.M.I.E.E., M.I.R.E.	Burndept Wireless, Ltd.
127 Dr. J. E. de Vos van Steenwijk.	League of Nations: International Institute of Intellectual Co-operation, Paris.
128 Miss H. A. Walsh.	National Union of School Teachers (London and Manchester).
129 K. Walter.	Horace Plunkett Foundation.
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131 L. C. Wharton, M.A.	(a) Philological Society. (b) School of Slavonic Studies.
132 J. Wilks, M.A.	University College, London.
133 E. W. Willis.	Carriers Publishing Co., Ltd.
134 J. C. Withers, Ph.D.	(a) Textile Institute, Manchester. (b) British Cotton Industry Research Association, Manchester.
135 I. Zvavitch.	Economic Dept., Trade Delegation of the Soviet Union in Great Britain.

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136 J. W. H. Brown.	National Union of Teachers.
137 A. W. Burton.	Department of Overseas Trade.
138 Alexander Farquharson M.A., O.B.E.	Leplay House.
139 Charles E. Hecht, M.A.	Food Education Society (Incorporated).
140 H. J. Jeffery, A.R.C.S., F.L.S.	Imperial Institute.
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145 A. P. Rowe.	Air Ministry.
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147 M. G. Tweedie, A.M.I.E.E.	Institution of Railway Signal Engineers, Reading.
148 Major L. Urwick, O.B.E., M.C., M.A.	Messrs. Williams and Norgate, Ltd.
149 Mrs. Withers.	
150 Miss K. M. Baverstock.	Medical Research Council.
151 E. P. Clarke.	Dunlop Rubber Co., Ltd., Birmingham.
152 Miss Douie.	London Society for Women's Service.

153 Leonard Hill.	(a) Messrs. Leonard Hill. (b) *Chemical Engineering and Chemical Catalogue.*
154 Mrs. Leonard Hill.	
155 P. S. Spokes, M.A. B.Sc.	Imperial Forestry Institute, Oxford.
156 D. H. Low.	
157 Miss D. P. Powell.	
158 E. E. Skuce.	Oxford Public Libraries.
159 Alderman Charles Squire.	Leicester Public Libraries, Museum and Art Gallery.

Numbers 4, 17, 71, 95, 100, 103, 123, 125, 138, were unable to be present.

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OPENING SESSION - - Friday, September 24, 1926.

The MASTER OF BALLIOL (Mr. A. D. Lindsay, C.B.E., M.A.), in welcoming the Conference said it was a most impressive thing to see all these various sections of English life coming to the Colleges to discuss their common problems. The days when the College doors were shut during the greater part of the year had well gone by and it was a very good thing when the colleges had resolved to encourage the use of their buildings for the purposes of conferences. He described the present conference as one for dealing with mental indigestion, for in this age we were suffering from a terrific accumulation of the materials and instruments of knowledge. This accumulation of data was usually described as knowledge itself, but it was not knowledge until it was in actual use. This Association was facing the problem of how to make all the vast stores of information available to those who needed them and could put them to active use.

He then introduced the Rt. Hon. The Viscount Burnham.

Viscount Burnham then addressed the Conference as follows :

"To me, as an ancient and almost worm-eaten graduate of this College, it gives the greatest satisfaction to have heard the Master of Balliol address his words of welcome to this Association. Even in my day Balliol was thought to be eccentric in its toleration. I believe that spirit of toleration to be above all its other claims to national fame, great though they are in many ways. It seems to me that the old Universities of Oxford and Cambridge, to both of which I belong, have only in this century realized themselves and begun to take their full and appropriate part in our national life. The great Master of my own Oxford days was Jowett and I cannot help recalling of him the flippant, if not ribald, couplet written with so many others I believe principally by Sir Cecil Spring Rice and Professor Mackail :

> "My name is Benjamin Jowett;
> I am Master of this College.
> What I don't know is not knowledge."

The continuity of the College tradition would have been after his own heart and would also, I am sure, have greatly pleased that broad-minded and great-hearted man who was my tutor when I was here and the immediate predecessor of the Master in his responsible office, I mean Mr. A. L. Smith, whose portrait hangs behind me.

I am credibly informed that at the League of Nations no speech is ever made in the Assembly which does not contain the refrain "for the organization of peace." The phrase has no sinister meaning; it is merely a tribute to the spirit of Geneva in the same way as it is now established as part of the procedure of Dail Eirann, the Irish legislature, that the first two sentences of every speech must be delivered in the Erse language. So here, I imagine, I must begin by expressing my deep satisfaction that

this association now exists " for the organization of knowledge." So far as knowledge is intuitive or hereditary you may not be called upon to your full power, but with our present equality of opportunity your work becomes essential to national progress and efficiency.

" Diffused knowledge immortalises itself," we were told a century ago, and knowledge means something vastly more important now than it did then. Whether the science of the last hundred years has made the world more beautiful or not, it has at any rate added largely to the realms of knowledge. According to Oliver Wendell Holmes " all generous minds have a horror of what are commonly called facts; they are the brute beasts of the intellectual domain." It may be so, but it is mainly upon facts illumined no doubt by the imagination and not upon the gossamer webs of fable and fiction that the possibilities of human amelioration depend. As Sir William Watson says " not for golden fancies iron truths make room."

I belong to a profession which is supposed to have eschewed facts that are beyond the range of general knowledge and that do not fit in to its preconceptions and its self-interests. The " all round journalist " is supposed to know something of everything but not much, and perhaps, if he is to write to order or as Lord Morley put it to complete his tale of bricks, not too much. The old idea of the all round journalist is however fading away. It is not the case any longer that the first requirement for newspaper writing is the art of assuming knowledge which is not there. The very extent and diversity of human interests which have been so much increased by the conquest of the air and the utilization of the ether for the satisfaction of human wants and ambitions have made special appropriation of knowledge more than ever necessary and even inevitable. That is the real explanation of your movement.

It may be, as Lord Milner said, that " the study of the language and literature of Greece and Rome is incomparably the best road of approach to the study of all language and history and to the study of the mind and character of civilized European man," but the area and the ground plan of the old learning are so limited and circumscribed as compared with the demands of the present age that knowledge must of itself become more departmental and individualized. On the other hand, the general connection and interdependence of the manifold and varied kinds of knowledge which is all science of one category or another, has always to be retained and adapted to the new uses and diversions for which it is required to be made progressively available.

It is in relation to the newspaper press that this Association comes nearest my own line of life. This Association is said to aim at " the free flow of necessary information and utmost mobility of non-confidential matter." In the jargon of the day we should say that this is " the mobilization of knowledge." It is an " information exchange " to bring together those who want to be put in touch and communion of understanding. We are

apt to forget that as that great soldier Lord Wolseley said in his *Autobiography,* ninety-nine out of every hundred Englishmen—and he included himself in the number—learn all they ever know from the daily newspapers. Dean Inge says in his last book that what the Englishman makes of his games he makes instinctively of his life. "Everywhere we find the same demand to make life easy, safe, and fool proof." The newspaper press affords the easiest means for the assimilation of ideas as well as for the conveyance of facts, which makes it all the more important the newspaper writer should be able to acquire his knowledge rapidly as well as accurately. My late friend Mr. George Russell tells a story of a popular Member of Parliament of his time who complained that he was disappointed with Lord Acton's famous library, afterwards bequeathed to the University of Cambridge. He said there was not a single book of reference in it. I rather sympathise with the Member of Parliament. He wanted special information in tabloid form and he could not get it. There is a controversy proceeding among historical writers as to how far they are justified in using newspapers for the making of history, and perhaps the best answer to the question is given with Mr. Punch's cartoon of the entrance of Germany into the League of Nations. "Ave et cave."

That great son of Oxford, Lord Bryce, in his last book on Democracy expresses the same fear. "It is important," he says, "for the historian when taking his facts from newspaper sources to ask himself (1) what are the means of knowledge in the newspaper; (2) what is its sense of responsibility; (3) does it or does it not write to tell the truth; and (4) for what class of people does it write?" That is very wise, no doubt, but the facts are taken from the newspapers, and surely the best way of getting at the facts, if you do not "grant the fact," is to get at the factor of the facts. Let him have the opportunity of a pure and unadulterated supply. I am well aware that you work in close collaboration with the Scientific, Technical, and Trade Press already. At your Conference of 1924 the Editor of the *Electrician* described the technical press as "a machine that works for good or evil on material that some one else has produced," and added that it must be "a mirror of the industry or profession that it represents." It has to give "an abstract or brief epitome" of all the knowledge that there is and the knowledge must be up to date. It must be "sufficient for to-day and for to-morrow as well." Unlike the newspapers the technical journal is not ephemeral but continuous. I am almost inclined, after reading all this, to think that the technical press ought to be the main financial support of this Bureau. Lastly I turn to a different side of your corporate usefulness. Science and learning know no national "bounds once overgone that hold men in," and internationalism is at once the secret and necessity of all advancement in original research and practical discovery. Internationalization of knowledge is internationalism in excelsis, and, as things now are, there are ample means of extending its boundaries. Since 1921 I have been connected with the Inter-

national Labour Organization of the League of Nations in having for three sessions presided over the International Labour Conference. Its principal function is the collection and collation of facts in the economic relations of mankind, and it has extended its activities to secure intellectual co-operation between the nations. The League of Nations itself rests on the interdependence of our civilized life, and demonstrates the truth of the axiom that we are all members one of another.

I firmly believe that we ought to take fuller advantage of the opportunities that now exist for the pooling of knowledge and the interchange of ideas, and I hold that the time is ripe for establishing closer relations of harmony and co-partnership in working out the intellectual future of mankind. Students of the same age, travellers by the same road, and heirs of the same heritage, we ought all to do what we can to enable one another to walk in the best light we have, to use Matthew Arnold's famous phrase. It has been said that "the humanities live on for ever." Some would have us believe that the sciences have driven out the humanities from the kingdom of knowledge, but to me it appears much nearer the reality of things to say that the humanities have swallowed up the sciences, and restored to science its classic and illuminating power. Just as the Universities have realized themselves in this century in a manner that seemed impossible to the old learning, so the more by such University Extension as you are undertaking will the University idea be exalted and made fruitful."

Brig.-General MAGNUS MOWAT then proposed two votes of thanks—to the Master of Balliol for granting the Association the privilege and pleasure of meeting in the College and to Lord Burnham for coming as the guest of honour and making the opening remarks. He hoped that Lord Burnham would allow his speech to be recorded in the Association's Proceedings and asked Dr. Hutton to second these votes of thanks.

Dr. R. S. HUTTON said he had the very greatest pleasure in seconding these votes of thanks. He mentioned that a large proportion of the membership of the American Special Libraries Association was made up from the libraries of the Daily Press in that country; he thought that the A.S.L.I.B. might look in the future for support from the Daily Press here.

The MASTER of BALLIOL in replying said he much appreciated the vote of thanks he had received for doing what would have been a great scandal if it had not been done.

GENERAL SESSION - - Friday evening, September 24, 1926.

Chairman:

Brig.-Gen. MAGNUS MOWAT, C.B.E., M.Inst.C.E., M.I Mech.E.

Brig.-General MOWAT much regretted that the Chairman of the Association was unable to be present through illness with the result that he had been asked to take the Chair. After reading a cablegram from the American Library Association, sending greetings and good wishes to the Conference, he asked Dr. Hutton to give a résumé of a letter and statement on the progress of the Association that had been prepared by Mr. Pearce.

Dr. HUTTON gave this and also mentioned the difference in the arrangement of the programme of this year's Conference in comparison with last year's, and called attention to the opportunity now given for informal discussions. He also pointed out the necessity for a larger membership and said it was desired to increase the number of members to 500 within the next year.

Mr. G. F. BARWICK, late Keeper of Printed Books, British Museum and Editor of the Directory then gave the following report as to the progress made:

REPORT OF PROGRESS WITH REGARD TO THE DIRECTORY.

The first steps towards the compilation of the Directory, which, as you know, is intended as a guide for persons in need of collected information on special subjects, were taken about the middle of June. A much discussed questionnaire was drawn up and some four or five thousand copies have been sent out, and in the majority of cases very satisfactory replies have been received. Further issues will be made as fast as we obtain lists from some of our kind helpers, who were unable to assist us until after the summer holidays. In some directions we shall not need to make general inquiries, for Lieut.-Colonel Newcombe is generously placing at our disposal the information about University Libraries which he has collected for his own work on that subject. Similarly the Museums Association, through its late President, Mr. J. Bailey, has promised information that will probably save many applications to provincial museums.

Let me now say a word about collectors. We, as children, often begin with butterflies and proceed through postage stamps to prints and drawings and perhaps ultimately to pictures or sculpture. Within these limits lie countless objects and the literature about them. Before death duties brought so many collections to the hammer they were mostly bequeathed or sold en bloc to some institution—an excellent practice which even death duties have not quite abolished. The transfer of such collections was occasionally noted in the London or provincial press, but large numbers have not even had that modest publicity and have remained more or less buried. It is one of our objects to ascertain where they exist and to register them in such a form that they can be made known to any who are interested in their subjects.

A few headings will give some idea of the scope of the Directory, outside the ordinary subjects of art, science, trade and literature: Deaconnesses, Quakers, the Pilgrim Fathers, visiting cards, fans, paper money, finger rings, wild beast shows, displays of fireworks, tickets for public entertainments. I remember many years ago hearing of a great historical collection of buttons from the earliest ages. The location was, I think, Manchester or Liverpool, and I should be glad to know where it is now, for no one could say that it is not worth a button! Somewhere, too, there is a collection of violins stored in glazed cases, and seldom or never touched. We should be glad to know if it is anywhere in the United Kingdom. But personally I know not what punishment could fit the crime of leaving a Stradivarius mute and inglorious! We

have not so far discovered any collection of Pianos or of Windmills, but there is at Southend a collection of printed matter about the windmills of Essex.

It is interesting to note how collections in London are reinforced by those in the provinces. Take as concrete examples: Clocks and Watches, represented by the Morgan and Fellows collections at the British Museum; those of the Nelthrop and Watchmakers' Co. at the Guildhall; another at the Institution of Civil Engineers, another at Coventry, and this is probably not the end of them. Take again Ceramics and Glass, which are well represented at the Patent Office Library, while at Stoke-on-Trent there is a collection of some 5,000 volumes on ceramics and at Birmingham, Glasgow and elsewhere there are special collections of books about glass.

The form of the Directory as at present contemplated is firstly, an arrangement under subjects, showing the location; secondly the locations under towns; thirdly an index which will mainly consist of the names by which many collections are known, such as the Malone, Garrick, Banks, etc., giving briefly their subject and location.

In speaking of collectors I omitted to mention those who collect money. All honour to those who, like Mr. Carnegie, devote it to good purposes. To the financial assistance given by his foundation the Directory owes its being and we venture to hope that the Carnegie United Kingdom Trust is adding another to its minor useful works. The word 'Trust' seems to be American for acquisition and Scottish for distribution.

The Directory, however, is by no means confined to registering collections; its further object is to include institutions, other than museums or libraries, where information and even practical help and direction may be obtained. Of the very first importance in these directions are Newspapers, which are always ready to help an inquirer on any subject in which they specialize. It would be a counsel of perfection to index even all the technical ones in our subject-list, but as there is a fairly adequate classification in *Willing's Press Guide* and an excellent one in Mr. Norton's list of technical papers it may suffice to call special attention to newspapers as one of the readiest and simplest means of getting information, and to these two indexes, which render it easy to find in any part of the United Kingdom a newspaper to which a special inquiry may be addressed.

Then there are the scientific societies, information bureaux, intelligence departments and the various clubs and societies that are able and willing to help us. As for willingness we have found it everywhere, and even some private collectors who have seen the press notice of the Directory have offered to reply to inquiries. The only instances to the contrary appear to be in the case of certain business firms who, I fear, think we want to know too much. But we have no wish to know the latest secrets of popular sauces or highly tempered steel; we only wish to help students who want to pursue the best courses of study and to obtain from practical sources some guidance to the best books. Those selected by a firm for its own library would not always be those of the class-room. And after all it is to the young that they must look for the maintenance of their prestige.

It will be readily seen that science, however high its quality, must take a secondary place in quantity, for the humanities cover a ground so much more varied and extensive.

I have already mentioned Lieut.-Colonel Newcombe and the Museums Association as fellow workers in furrows of the same field; to them I must add Mr. Rye, whose book the *Libraries of London* will be of great help to us. Mention must also be made of the League of Nations which is setting forth to compile a world list of sources and texts. There is ample room for all.

No book of reference, except a time table, and not always that, is up-to-date at the time of publication, and our Directory when it appears will leave ample work for the Association of Special Libraries—namely, to collect current information, to register the collections which have been missed and to note the locations of new ones and of new sources of information. Perhaps by this time next year they will be thinking about a new and improved edition.

THE "OUTLIER" POLICY OF THE CARNEGIE UNITED KINGDOM TRUST.

By A. B. HYSLOP

(Treasurer, Carnegie United Kingdom Trust).

This subject has been dealt with at both the previous conferences of this Association—at the first by Colonel Mitchell, Secretary of the Trust, at the second by Mr. Gorrie, Convener of the Trust's Library Committee. In view, however, of the three-cornered conference which is to be held in November between representatives of the Central Library for Students, interested special libraries and the Trustees, it may be well for me to touch on the origin of the policy since a knowledge of its beginnings is essential to a full and sympathetic understanding of the present position.

At the commencement of the Trust's operations in 1914 and for some years later the "outlier" system as now understood was not thought of. In continuing the assistance to the library movement begun by Mr. Carnegie, the Trustees, however, operated from the outset on a wider basis and even as early as 1914 their grants included the first of a series to Special Libraries. The chief aim of these early grants was to benefit those immediately concerned by increasing the efficiency of their libraries. The possibility of extending the libraries' spheres of usefulness was not then visualised. But the desirability of making specialist collections more widely available soon became evident and by 1919 it had become a general condition of grants that bona fide non-member students should be given reasonable access to the libraries receiving Trust assistance.

While a policy of special library grants was being gradually evolved developments were also taking place in the more popular side of the Trust's library activities and in 1915 the Central Library for Students was established with the object of providing for the needs of serious but not highly specialised readers. This was the original aim of the promoters of the Central Library but during its brief life the conception of its function has grown from that of a central collection of books for adult classes and individual students to that of a national reserve pool for the whole public library service of the country.

With this phenomenal development in the character and possibilities of the Central Library it is not difficult to see how from the Trustees' point of view their two separate lines of library activity—grants to special libraries and support of the Central Library—have gradually and naturally converged. On the one hand a body of serious readers, growing rapidly in

number as the facilities offered by the Central Library became known to borrowers from Town and County Libraries, and with increasingly specialised demands—on the other, many great collections of books far more than ample to meet the demands upon them but to which for financial, geographical or other reasons, these readers had not hitherto had access. What more natural than a desire to bring the two together?

These then briefly are the considerations which have led to the Trustees' present "outlier" policy under which specialist libraries receiving grants are asked to lend the contents of their collections through the Central Library for Students to readers in all parts of the country.

Let me now deal with one or two practical points. There are three difficulties which have suggested themselves to specialist library authorities when confronted with this request of the Trustees.

In the first place the magnitude of the demand which may be made upon the collection is quite unknown, and the administering body is naturally apprehensive lest the requirements of non-members applying through the Central Library should become so excessive as to cause considerable inconvenience to members. This is a reasonable anxiety, but in no case yet has the wider opening of the door of a library led to such a result. Moreover there exists a factor which, so far as can be foreseen at present, should prevent the situation arising in anything like an acute form. The demand upon very highly specialised collections must of necessity remain limited since the number of persons capable of benefiting from them will always be comparatively small. At the other end of the scale the less highly specialised collection will have much more in common, so far as its contents are concerned, with one or more sections of the Central Library and the greater the demand for the books in the specialist collection the more reason will there be for adding those most often asked for to the Central Library's own stock. In actual practice it would probably work out that the "outlier" would only be called upon for publications of more general interest if the Central Library's own copies of the particular books were all out. Moreover a certain proportion of such books would probably be included in the stocks of Borough and County Libraries and even the Central Library would not be asked for them.

The second difficulty is created by the fear that the lending of books through the Central Library for Students will in the case for example of learned societies tend to reduce the ordinary membership of the Society. Members, finding that they can have full use of the library without paying their annual subscription, will discontinue their membership. The measure of this danger must depend, of course, to a large extent upon what other inducements to membership the Society has to offer, but there is a very general desire on the part of students to be associated with others of kindred interests and it may be that the circulation of a Society's books to isolated students will prove useful propa-

ganda and lead to an increase rather than to a decrease in membership.

The third difficulty is the most important and will be one of the chief points to be discussed at the "outlier" Conference in November. It is the question of how long an "outlier" is under an obligation to continue its arrangement with the Central Library in return for the Trust grant. Is it bound in perpetuity? I do not wish to anticipate the discussions of the November Conference, but it might be well just to state the case so that those whom the question concerns may be turning it over in their minds with a view to putting forward definite proposals when they meet the representatives of the Central Library and the Trust.

The Trust's scale of grants has, up to the present, been purely experimental and in most cases the actual needs of the particular library have been considered and the amount of grant has been fixed at a figure which it seemed probable the library could profitably use. Where, for example, there have been substantial arrears of unbound periodicals the grant has provided for the cost of binding. Where a catalogue has been non-existent or incomplete, provision has been made for its compilation or completion. Except in a very general way the probable demand upon the library has not been a factor in the fixing of the amount for the very good reason that the demand could not with any degree of accuracy be foreseen. The Trustees' aim has been rather to make good defects in the "outliers," and they have very largely accepted the views of the governing bodies as to the improvements required to perfect the libraries.

The result of this policy has been that some libraries have received substantial grants but little demand has yet been made upon them. In other cases the demand has been much greater although the grant was less. It would be difficult to lay down at this early stage of the movement any basis for calculating the period which a grant should cover. No attempt has been made to define what the relationships between the Trust and the "outliers" should be say ten or fifteen years hence; indeed the duration of the agreement has been definitely left vague. In some instances the claims made upon the "outlier" have been so few that had the grant been invested the annual interest would have far exceeded the amount required to buy new copies of the books asked for in any one year. So long as the demand continues to bear this relationship to the grant, continuance as an "outlier" without further re-imbursement for services rendered would not appear to impose any hardship upon the specialist library. On the other hand it may be safely affirmed that the Trustees would not wish to exact from "outliers" a service exceeding in value the financial assistance received. It must be remembered, as indicated earlier in my remarks, that the Trustees are interested not only from the Central Library point of view: they are concerned also with the development of the specialist libraries themselves.

It is not easy to define precisely the scope of the Trustees' policy because the term "Special Library" is a very comprehensive one. But the Trustees are furnished with a guiding principle in the fact that under their Trust Deed their funds must be expended on charitable purposes and must moreover be used in benefiting "the masses." These limitations lend themselves, of course, to very wide interpretation but they do enable the Trustees, in certain cases, to decide readily for or against the particular application. Viewing the matter from this standpoint the Trustees are clear that a learned society existing for the spread of knowledge for its own sake, falls within their legitimate scope. On the other hand they are equally clear that an important Research Association, concerned primarily with the development of a particular branch of industry or commerce does not. Between the two extremes represented by these types fall the many cases which must be decided to a large extent upon their respective merits.

But it is important to remember that the Trustees' conception of library co-operation is not restricted to the field in which they themselves feel at liberty to operate, and it is because they realise that a national service must be built upon the widest possible foundation that they have welcomed the formation of A.S.L.I.B. embracing, as it does, all branches of the special library movement and expressing the widespread and spontaneous desire for co-operation which is manifesting itself in all library circles.

The Trustees' estimates for 1926-30 include a "special library" allocation and grants will doubtless be offered during the remaining four years of the quinquennium to libraries which have not yet linked themselves up with the Central Library as "outliers." But with the existence of A.S.L.I.B. and the increasing willingness on the part of Societies and Associations to make their libraries widely available there are good grounds for believing that the extension of the co-operative idea will, in future, depend less and less upon Trust grants.

INTERCOMMUNICATION BETWEEN SPECIAL LIBRARIES.

By LUXMOORE NEWCOMBE
(Librarian of University College, London, and Librarian-Elect of the Central Library for Students).

These few notes make no pretence at dealing exhaustively with the vast subject of intercommunication between libraries, nor do they give any useful or even historical information on the subject. They are merely intended to introduce a few suggestions as to possible ways in which innumerable special libraries scattered over a large area may keep in touch with one another and—what is more to the point—help one another by the interchange of information or material.

The problem of intercommunication between special libraries appears to me to be two-fold: (*a*) the exchange of information, and (*b*) the inter-loan of books, pamphlets, or other documents. If, as we must do, we admit the foolishness of each library trying to deal with these problems individually, we are forced to accept the necessity for some form of properly organised central agency through which all inquiries may be dealt with.

I believe that the necessary machinery for the establishment of this central agency already exists and that it only needs more power behind it and a more generous lubrication to give us all we can reasonably hope for in this direction. Actually, there are two machines at our disposal, each performing its own particular function and yet each dependent on the other for the full success of its operations.

The first of these machines is A.S.L.I.B. What particular function has A.S.L.I.B. in our scheme of co-operation? As I understand its constitution its business is to deal with our first problem, the provision of a guiding hand which will lead us to the source from which our information may be obtained. It is not the business of A.S.L.I.B. actually to supply the detailed information. An inquiry can be dealt with by A.S.L.I.B. both quickly and cheaply because once it has had time thoroughly to organise it will be able to answer 90 per cent. of the inquiries it receives by a mere reference to its registers, and in the case of the other 10 per cent. it is far more likely to know where to seek information than an individual who is dealing with a matter outside his own particular subject. This brings me to a point of vital importance to the future success of A.S.L.I.B.—the absolute necessity of working on the admirable "When found make a note of" principle. In other words it is one of the first duties of A.S.L.I.B. to build up a reference catalogue, file, register—call it what you like and let it take any convenient form—of the source from which information on any subject likely to be useful to its members may be obtained. I realise that the "Directory of Special Libraries" will cover this ground to a considerable extent, but such a directory, like printed library catalogues, is beginning to be out-of-date before it is actually published, and a year or two after publication it is obsolete so

far as real live matter is concerned, though the original matter will always remain of the highest value for earlier information. The A.S.L.I.B. register on the other hand should always be right up-to-date and so able to supply with the least possible delay—and time is often a matter of the first importance—the source of any information required.

How is this register to be compiled and kept up to date? A great deal of information would be obtained as the result of actual inquiries made. This could be supplemented to a considerable extent by notes made from the press, both by careful systematic search in the more helpful journals and by references found casually and noted. All this would be the business of A.S.L.I.B. But each special library or information bureau could render valuable assistance to the central register in two ways: (*a*) by information as to any fresh class of material added to its own collection, and (*b*) by particulars of any information which it has obtained from an outside source. Obviously, I do not mean by this that it should report individual books or pamphlets, but only such material as is likely to be of value to other research workers. So much for A.S.L.I.B.'s share in the scheme.

Now we come to the second of our machines—the one which is going to produce the more solid matter in the way of books, pamphlets and documents. Here again our machine already exists in an embryo form in the Central Library for Students. In the past this library has been able to do very little for those special libraries in which many of us are particularly interested, but that is no reason why it should not do a great deal in the future. Like A.S.L.I.B., the C.L.S. is still in its infancy and is not yet in a position to fulfil what I consider to be its duty to special libraries, but I have every reason to believe that it *will* be able to do so if the special libraries show any desire for assistance in this direction,

At the moment the C.L.S. is not in a position to give much help to the specialist out of its own modest stock of 30,000 volumes. It is possible that it never will do much in this way, as it may be that its business always will be the provision of books of a more general character to students who have not yet reached the stage of specialisation in its higher sense. This is only a suggestion, as I have no intention of laying down any kind of policy for the Central Library until I, and others better qualified to judge, have had time to consider the whole of this big question from all angles. But it is through its system of "Outlier Libraries" that the Central Library for Students will be able to assist the specialist—and assist him to a very considerable extent. I do not propose to enlarge on this side of the work of the Central Library as it forms the subject of Mr. Hyslop's paper, but it must be borne in mind that this outlier scheme is one that is going to mean a tremendous lot to any future efforts towards more effective co-operation between special libraries.

It is possible that it may be the business of the Central Library for Students—here again I am laying down no policy—to extend the admirable work which was started a couple of years ago by

general libraries, which are distinctly special libraries though on the humanistic side. The need for co-operation between these libraries is as great as on the scientific and commercial side and I am anxious that we should not lose sight of that under what may appear to many of us to be the more pressing needs of our own particular group of libraries. In dealing, therefore, with the question of co-operation between co-operators I am treating the term "special library" in its fullest sense.

It is useless to evolve an elaborate scheme for co-operation between the smaller units if the question of co-operation between the larger units is to be neglected. We have, therefore, now to consider not only how such bodies as A.S.L.I.B. and the Central Library for Students are to avoid unnecessary and wasteful overlapping, but how they are to ensure that no section of the work falls to the ground between two stools. Not only that but as we have now broadened our outlook by bringing in special libraries and special collections of all kinds, I am no longer satisfied with co-operation between A.S.L.I.B. and the C.L.S. only. We must bring about co-operation between all bodies working for the extension and welfare of libraries. We must consider the work of the Library Association and of the Joint Standing Committee on Library Co-operation, and must link up wherever necessary. I believe that the ultimate solution to co-operation between these larger units lies in the direction of a central building in which the headquarters of all these bodies may find a home. Possibly other kindred bodies such as the Association of Assistant Librarians, the Museums Association, and the Bibliographical Society might also be housed in this central building.

Think what this would mean! In one building we should have a great national clearing-house for bibliographical information. It would be the natural centre for all inquiries—whether for the actual loan of books, the tracing of books, the supply of information or the provision of photographic reproductions or translations. An inquiry which could not be dealt with by the body to whom it was addressed would immediately be passed on to the right quarter. Many inquiries might concern more than one body, each of which could deal with its own particular share simultaneously, as it would be easy and quick to pass the inquirer's communication from one body to another. I am not suggesting that any of the existing bodies should amalgamate, but merely that so far as their interests overlap they should work in the closest liaison.

Other appropriate bodies might also be provided with accommodation in our national headquarters, and it would be a convenient centre for such work as the compilation of future editions of the "Directory of Special Libraries," union lists of all sorts and possibly even the Library Association's "Subject Index to Periodicals." The loan collection of the "Subject Index" might well be housed there. Our building should have a small hall for meetings and conferences and a committee room which would be the natural meeting place of the governing bodies of

ones. I am not offering any solutions to these difficulties—though I believe they can be found when the time comes—as I think it is unnecessary until we have decided that all or any of the suggestions I have made are really going to help on the great work of useful co-operation.

I have now explained very briefly how, in my opinion, the more complete co-operation of the various special libraries and information bureaux may be assisted by A.S.L.I.B. or by the Central Library for Students. To put the whole thing in a nutshell, the question: "Where can I get information about belt-driven reversing gear?" would be dealt with by A.S.L.I.B., but "I want to borrow Snell and Rogers' 'Belt-driven machinery,'" is a matter for the Central Library for Students.

Now we come to the question of what I might call co-operation between co-operators. I am inclined to think that on the possibility of this super-co-operation depends, to a very large extent, the success of the suggestions I have previously made.

Before we discuss this point in detail I should like to consider for a moment the type of library which we group for the purpose of co-operation under the heading "special library." I believe I am right in thinking that from the point of view of many members of A.S.L.I.B. a library is only special when it not only covers a very limited and clearly defined field but is also administered by a librarian who is himself an expert in that subject. This to a large extent, though not entirely, limits us to those libraries which are commonly known as Commercial Libraries. It is this type of library that I have so far had in mind in this paper, and my suggestions have been made with the object of assisting libraries of that class. Now, however, I would like to consider special libraries in the broader, and I believe more accurate, sense. Every large general library contains at least one special collection of books devoted to one particular subject. This collection may or may not be kept up-to-date and in all probability there is not a specialist librarian in charge. But in spite of that apparent drawback many of these special collections may well prove of great value. If, for instance, we take a few of the special collections in our university libraries we find many subjects of commercial interest. We have dyeing and textiles at Leeds, fuel technology and glass technology at Sheffield, and chemical engineering at University College, London. It would be easy to give a much longer list. Now although each of these collections is not administered by a specialist librarian—no librarian of a general library can be an expert in all the subjects covered by his library—the head of the department concerned, who most certainly is an expert, is intimately connected with it and largely responsible for its upkeep, so that actually it becomes a special library in the strictest sense. Then again we have the commercial and technical libraries attached to some of our larger municipal library systems, and the important libraries of some of the professional bodies and institutions. But in addition to all these libraries which have a scientific or industrial interest there are many libraries, and collections in the big

the Joint Standing Committee on Library Co-operation. This Committee established an Inquiry Office which endeavours to trace books—in practice largely periodicals—which scholars or research workers have been unable to obtain for themselves. So far, this work has been confined mainly—though not solely—to the university libraries, but its field of activity could very usefully be extended and the C.L.S. might be able to help in this extension. If this work were more fully developed it would be possible for the specialist in any branch of science or industry to trace the whereabouts of many books and periodicals which he may urgently need to consult but which he now has to go without simply because he is unable to find them for himself.

There is another branch of co-operation that needs some central organisation to deal with its development. I refer to the provision of cheap reproductions of articles in periodicals, of illustrations, or even of complete books.* Many large libraries have their own departments for the supply of reproductions, but most of these are necessarily run on a comparatively small, and thus uneconomical, scale; they are moreover often able to provide only photographs, which are not the cheapest form of reproduction. If a special department could be established in London for the reproduction of books by the cheapest process, and if that department had access for the purpose of reproduction to all the great collections in the State and other libraries in London, it would be possible to provide accurate copies of pages from something like fifty per cent. of the books to which specialists might need to refer. In this way a service of inestimable value could be provided at a most moderate cost. "The increased provision of photographic and other copying apparatus" is, I know, an item in the programme of A.S.L.I.B., but what I want is a special department, possibly under the control of A.S.L.I.B. or the C.L.S., actually to *do* this work.

Still another need is a central office to deal with the translation of articles in periodicals. Not only is this necessary to meet the difficulty sometimes experienced in obtaining satisfactory translations, but the existing system—or, rather, lack of system—frequently leads, I am given to understand, to the same article being translated over and over again by different persons. Once an article were translated in the central office copies could quickly and cheaply be supplied to all applicants. I do not suggest that all articles in foreign periodicals should be translated, but merely that once an article had been translated for one applicant it should be available for all. Some system of charges would have to be devised whereby the first applicant did not pay more than his fair share.

I am not suggesting that either A.S.L.I.B. or the C.L.S. is in a position to take on all these extra jobs immediately. Clearly much extra work would be involved and this would necessitate augmented staffs and possibly more adequate office accommodation. This raises many difficulties, especially financial

* This suggestion does not apply to modern books, whether covered by copyright or not, but only to such older books, MSS., or other documents as are frequent copied now.

A.S.L.I.B., the Central Library for Students, the Library Association, the Association of Assistant Librarians, the Joint Standing Committee on Library Co-operation, the Museums Association, the Bibliographical Society and kindred bodies. It should have its own reference library which should endeavour to provide a really representative collection of bibliographical works and books on all branches of library economy and should possess every possible aid to the tracing of books and material. It might incorporate the library of the Library Association, and possibly the Association of Assistant Librarians might add their library and treat the building as their headquarters. The valuable library of the Bibliographical Society might be housed in the same building, though not necessarily forming part of the main library.

And there is one more thing I want in our central building—a club room. It will be said that in making this suggestion I have drifted right away from the subject of co-operation. But I have not. On the contrary I have only just got to the most vital factor in the whole scheme—personal contact. Just think for a moment what that club room is going to do for us. Think of the possibilities of meeting fellow workers whom we might otherwise never meet: think of the ideas that will be exchanged in that room, of the innumerable points of common interest that will be discussed, and the information gained from conversations with some previously unknown colleague. Members of the various bodies associated with the building will be brought into contact with one another, to the infinite good of all. This personal contact is going to make co-operation a very much easier problem.

To sum up, here is a great central building in which we can obtain books and information, translations and reproductions of articles urgently wanted, consult a first-class bibliographical reference library, hold our meetings, and meet our colleagues. If that doesn't lead to more effective co-operation—well, what will?

* * * * * *

Mr. B. M. HEADICAR, F.R.S.A. (London School of Economics and Political Science), stated in regard to the use of the Library of the London School of Economics for loan purposes, that he had received a few inquiries from the Scottish Central Library for Students but not from London. This was probably due to the fact that it was not yet generally known that the Library of the School might be called upon. He said that he wanted the Library to be used for two reasons; firstly because its contents might be of great value to students, and secondly in order that one might get a reliable guide as to the probable demand to be met from the one year experiment which had been agreed upon. Mr. Headicar suggested that a paragraph be inserted in the *Library Association Record* and elsewhere to the effect that the stock of this particular library was, within limits, available.

With regard to Colonel Newcombe's paper generally, he considered its suggestions practical and necessary. Very similar proposals were put forward twenty years ago in a pamphlet by Mr. Joseph Edwards. He was doubtful, however, about reproducing scientific papers in any quantity; the question of copyright surely came in here, and no publisher or author was likely to agree readily to anything which was bound to affect the sale of a journal. In regard to translations the *Economic Review* had

an admirable department for work of this kind, and possibly their help might be enlisted either in a general scheme or in individual cases.

Mr. L. STANLEY JAST (Manchester Public Libraries, etc.) considered that Colonel Newcombe had been a little too ideal in his suggestions as to the dissemination of information and the pooling of library resources. His suggestions, excellent as they were, did not appear to be immediately practical, and the imperial rôle he assigned to the Central Library was very far off. Mr. Jast thought that some organization on regional lines offered a more possible solution of the problem. The main difficulty appeared to him to be the securing of a catalogue in some central place recording the material, especially the recent material, contained in the "outlier" libraries. A central bureau for printing catalogue cards would seem to be the proper basis for any far-reaching scheme for pooling library resources.

Mr. W. C. BERWICK SAYERS, F.L.A. (Croydon Public Libraries Committee), thought that the interchange of information which everyone desired and the avoidance of the duplication of effort must depend upon some form of centralized cataloguing which would give indication of where the material could be found. The principal point in Colonel Newcombe's paper was the suggestion that a centre for all bibliographical and library societies should be instituted which might be based upon the Central Library for Students. The fact should be borne in mind, that when the Library was in full working order it would contain at least a million volumes and would be a sort of lending equivalent of the British Museum. He did not consider this to be merely visionary; there was certainly every argument for making it the central home of all library organizations. He hoped that the matter might by resolution be remitted to the Council, with a view to exploring the possibilities of practical action amongst the various library organizations.

Miss G. SEARIGHT (League of Nations Union) in referring to Mr. Hyslop's paper, said that she represented an "outlier" library; the demand on their stock from the Central Library had been very small—possibly because their own very large membership tended to make people apply to them direct. They had found no diminution in membership, perhaps because people joined them for reasons other than the use of the library. The main difference that the Carnegie grant had made to them was that whereas they had originally intended to make an extra charge of 2s. 6d. for the use of the Library, the fact that the books were free to all through the Central Library had made them place their books at the disposal of their members without extra charge.

Dr. E. E. LOWE, B.Sc. (Leicester Public Libraries, etc.), asked Mr. Hyslop whether the Carnegie Trustees had offered grants to Special Libraries on condition that they came into the "outlier" library scheme. Could not the Trustees review the field covered by the present "outlier" libraries and invite those which would fill gaps to come into the scheme? It seemed to him to contain the germ of true library co-operation.

With regard to Colonel Newcombe's paper; he did not regard the provision of a central union catalogue as being of such essential importance as some of the previous speakers in the discussion had felt it to be. The main thing was to have some recognized channel of approach to these libraries, such as could be provided by A.S.L.I.B. and the Central Library for Students, so that one could as a matter of right send in requests for information knowing that they would be referred to and considered by the appropriate Special Library or Information Bureau. Without necessarily holding catalogues of all the associated libraries the central body or bodies would know to which library any particular inquiry should be referred for solution.

Mr. ERNEST I. ROBSON, M.A. (Institute of Agricultural Engineering, Oxford), suggested that the opinions expressed on Colonel Newcombe's paper seemed to have arisen from a difference of view as to the true function of a library. He considered a library to be, as its name denoted, a place where books were kept and while it was the

duty of a librarian to refer inquirers to books likely to be helpful; he did not consider it his duty to give information generally. For that the student must go to the expert.

On the question of translations of which he had had some experience, he did not agree with the idea of a central translation bureau. Technical translation was a difficult matter. A clearing-house for translations would probably serve the purpose better.

Colonel Newcombe's suggestions might not all be feasible, but they were all distinctly useful.

Mr. C. R. SANDERSON (Library Association, etc.) pointed out that librarians had now gone far beyond the stage indicated by the last speaker; they had learned their lesson through experience and could not unlearn it. They began by producing a book in answer to the demand by a person who knew that that individual book was available; they advanced to the function of guiding a person to the best book for his particular need; they had now reached a stage where they collected and redistributed *information* obtained from many books (and other sources) and presented it in a form ready for immediate use.

Moreover, contrary to what had been suggested, libraries *did* interchange information which they had available, more particularly so since the formation of this Association. In London this was fairly easy, because so many specialist sources were congregated there. It would be almost equally the case outside London when the Directory appeared.

The Right Hon. the VISCOUNT BURNHAM, M.A., C.H., LL.D. asked what were the relations between this Association and the Universities, especially the smaller and newer Universities, as these latter must have a great demand which they could not always supply from their own resources and with which this body would be in touch. He also asked if the Association kept in view the fact that many Training Colleges were altering their curriculum and going in for specialized subjects.

Professor F. E. SANDBACH, M.A. Ph.D. (Association of University Teachers, etc.), in reply to Lord Burnham's query as to the connection, if any, between the modern Universities and A.S.L.I.B., said that the Joint Standing Committee on Library Co-operation, of which he was the representative, stood almost entirely for these modern Universities and had become a member of A.S.L.I.B. The Association of University Teachers first called together a conference of delegates from the modern Universities and similar Institutions, and this Conference appointed the Joint Standing Committee on Library Co-operation. Its main work so far had consisted in trying to discover loanable copies of publications required by University investigators (usually members of University staffs) for the prosecution of their researches. But it had occasionally been able to render this service to other research workers and was always ready to do so if possible.

With regard to Colonel Newcombe's suggestions, Professor Sandbach said he was convinced that they deserved every encouragement and support in order that they might be realized, even if with some modifications. Such suggestions, brought forward in such an assembly as this, were bound to meet with criticism and opposition from people of long and wide experience who saw all the difficulties and had, perhaps, grown pessimistic as the years had gone by. For himself, he was still an optimist, in spite of advancing years, and he sincerely hoped that at the proper time a resolution regarding these suggestions would be put and carried.

Mr. EDWARD A. MARTIN, F.G.S. (Croydon Public Libraries Committee), called attention to the fact that there was a tremendous circulation of specialist books from the libraries of the London Learned Societies, and that these books met a large part of the demand set up by students in the Universities, new and old. In regard to the matter of co-operation between libraries, laudable as this might be he would like to know to what extent firms and commercial associations represented at this Conference were willing to co-operate and pool the information at their command. Firms had secrets which they wished

to protect, but it might be desirable to circulate a questionnaire asking how far they would go in making this information available. So far as municipal libraries were concerned, some difficulty might be experienced in obtaining the consent of libraries that spent large sums on books to co-operate in making good deficiencies in libraries that are only able to spend but small sums.

Major L. URWICK, O.B.E., M.C., M.A, (Messrs. Williams and Norgate, Ltd.), said that mention had been made of the difficulty that had been experienced in getting business firms to give information. The "secrecy complex" in British business was a very tricky thing. One of the first services this Association might render was to get firms to distinguish between what was public information and what was private. He suggested that if libraries belonging to business houses were approached with a view to exchanging such information only as was public, co-operation would be secured more easily. Could this Association get business libraries to come together and see if they could not cut down expenses by the interchange of information of a non-confidential character? An organized scheme of this type should not be incapable of realization.

Mr. L. D. GOLDSMITH, B.Sc., F.I.C. (General Electric Co., Ltd. (Research Dept.), Wembley), said that some of the speakers seemed to be suffering from a secrecy complex. An information bureau or library connected with an industrial concern would be usually only too glad to answer any reasonable inquiry from outside, even from people in the same branch of industry. The Research Laboratories with which he was connected made a point of publishing most of their original work, and were always willing to give information freely to inquirers. The only exception was, of course, in the case of strictly confidential information and so-called trade secrets. The latter, by the way, were far rarer in modern large industrial concerns than people outside imagined.

On the other question raised by the last speaker as to the possibility of the abstracting and indexing of published literature being done by one central organization, this was impossible because research workers and technicians generally always had to read and abstract their articles from their own point of view.

A central body for the collection and classification of scientific and technical information would not be of the least value to such workers. They must either do the work themselves or at any rate have it done by somebody in intimate touch with their work.

Mr. H. GREENWELL, F.S.S., Assoc.M.I.M.E. *(The Colliery Guardian,* etc.,) stated that one of the difficulties to be overcome arose from the fact that in the minds of many people, co-operation meant the getting of other people to do their work for them. They failed to realize—or possibly they did realize—that the accumulation of knowledge, especially that of a specialized character, not infrequently entailed considerable expenditure of money and labour. This might account for the unwillingness of some British firms to pass on information to others who might be their rivals in business.

Mr. FOSTER SPROXTON (British Xylonite Co., Ltd., Manningtree) said he wished to emphasize Mr. Goldsmith's remarks on the exaggerated idea that prevailed about the secrecy practised by manufacturing companies. There must, of course, be trade secrets, but the great bulk of the information collected and indexed in industrial libraries was not of a confidential nature and could generally be passed on to bôna fide inquirers. The fact that the initial steps in the formation of this Association were taken by representatives of manufacturing interests must not be forgotten, and it was fair to assume that every industrial firm represented in the list of visitors to this Conference was willing to co-operate in the interchange of information.

Colonel E. L. Johnson (Cleveland Scientific and Technical Institution), Principal J. F. Hudson, M.A., B.Sc. (Huddersfield Technical College, etc.), Mr. P. K. Turner, A.M.I.E.E., M.I.R.E. (Burndept Wireless, Ltd.), Mr. J. A. McIlveen (Messrs Cadbury Bros., Ltd., Birmingham), Dr. R. S. Hutton (British Non-Ferrous Metals Research Association, Birmingham), and Mr. W. L. Cooper, M.A. (Bristol University), also spoke.

SECTION 1 - - - Saturday morning, September 25, 1926.

Chairman:
Mr. W. BARBOUR, M.A., B.Sc.

SYSTEMATIC INDEXING.

By J. KAISER.
(Formerly Chief Bibliographer of the Engineering Societies' Library, New York, etc.).

1.—Just thirty years ago I was working the Dewey system at a Philadelphia library. Besides cataloguing, there was an unusual amount of indexing occupying an entire department of some dozen workers. Dictionary catalogue and index were not only for use of the public, but also constituted the main equipment of a set of men compiling reports on any required subject. This acted to some extent as driving power as well as a check on both catalogue and index.

2.—The dictionary catalogue did not work particularly well for the books, although constructed by trained labour and on the most approved lines. There were large collections of photographs, for instance, which could not be placed under the assigned numbers. To get over the difficulty I finally used the whole range of Dewey numbers for them, prefixing an initial letter to distinguish them. A similar procedure was followed for maps and charts. The indexing was done on the catchword plan. It was rather weak, the main trouble being duplication, i.e., the same information could be found under several headings (not counting localities), which made it obligatory to search the cards under all likely subjects so as not to miss desired information. Duplication of this kind also occurred in the dictionary catalogue, but to a less degree.

3.—My problem then was to work out a suitable system for the indexing. From the standpoint of organization there was an obvious advantage in having both cataloguing and indexing done on the same basis, especially in view of the use made of them by the compilers. This induced me to examine the Dewey system rather more minutely than I had done previously, in order to discover if such a common basis existed or could possibly be worked out. However, I found so many weak spots that I finally decided against it, and worked out plans which developed into Systematic Indexing.

4.—In the following I am mainly dealing with direct access and duplication (the most difficult problems in managing large masses of cards, as in indexing), and will compare results with those of Dewey and Brussels, with which I presume you are familiar. To facilitate explanation, I have prepared a short list of headings taken from the Relativ Index of the Dewey Classification[1]. These headings have all five or more call

(1) 10th Edition revised. No complete Brussels Classification is available and my copy is in London.

numbers as indicated by the numbers following them. In some cases like Iron, Power, Water, some of the call numbers are due to these terms being also taken in an adjectival sense, but this does not materially affect the question of multiple call numbers for the same subject. The headings have been selected mainly for illustrations of systematic indexing and discussion of classification.

5.—List of Headings from Dewey Relativ Index with number of call numbers given for each.

absorption 11
ACIDS 8
adulteration 6
AGRIculture 6
AIR 38
analysis 33
ANIMALS 50
ARMS 9
attraction 6

BACTERIology 5
BOOKS 38
BUILDINGS 15

CABLES 11
circulation 31
COAL 19
COLOURS 9
combustion 6
composition 13
construction 7
consumption 8

decoration 10
development 16
digestion 12
drainage 10

education 16
ELECTRICITY 14
engineering 10
evaporation 8

FACTORIES 10
FATS 15
filtration 6
FORCE 15
FOOD 36
freezing 7
FUEL 8
FURNACES 8

GASES 19
generation 8

illumination 8
inspection 6
IRON 32

LABOUR 15
LAND 21
LIGHT 26
lighting 12

MACHINES 8
MANUFACTURES 6
methods 10
MERCURY 8
MILK 18
MOISTURE 17
motion 13
MOTORS 7

navigation 7
NITROGEN 7

OILS 9
ORES 6
organization 12
OXYGEN 6

PETROLEUM 7
PIGMENTS 10
PIPES 10
POTTERY 6
POWER 18
preparation 6
preservation 9
printing 9
production 7

respiration 7
RIVERS 6
ROADS 7

SILK 7
SPRINGS 6
STEEL 12
stimulation 9
SUGARS 8

tests 8
TIMBER 10
TIN 8
training 13
transmission 12
transport 14

VALVES 9
ventilation 10

WAGES 11
WATER 72
WOOL 10
WORKMEN 7

ZINC 6

Capital letters denote concretes.
Small letters denote processes.

6.—*Elimination of Duplication.* Let me explain what I mean by duplication. Using the list, certain information may be filed under Coal, but with equal reason it may also be filed under Combustion, Analysis, etc., or under their respective call numbers. When information is wanted on Coal, every one of such likely headings would have to be searched each time in addition to Coal, which not only involves a good deal of extra time, but also considerable uncertainty as to what headings should be searched or disregarded. Maximum duplication occurred in the index with just such terms of commodities as Coal and terms implying an action or verb, like Combustion, etc. Assume that there are 1000 cards on Combustion of Coal: we may file 1000 cards under Coal, and another 1000 under Combustion. It is readily seen that the second thousand gives really no new information, but does make extra work in writing, handling, consulting, searching, etc.

7.—I found that this duplication can be stopped almost entirely by limiting main headings to terms of commodities and using terms of action or verbs for divisions. For let us assume that we have a number of cards on Coal; they can quite well be divided into Analysis, Combustion, Composition, Testing, Transporting, etc. In this way all the entries under the latter terms are cut out, and nothing is lost; for supposing information is wanted on Combustion, etc., all we have to do is to attach this term to that of some commodity—Coal, Fuel, Oil, etc.—and Combustion will be found as a division under each one if there is information. Besides, nobody would expect to find information on Combustion generally in an index, but always combustion of something, i.e., a commodity.

8.—*Direct Access.* In reporting, generally, only the most specific information was of any use. General subjects would practically never be called for. In the list, Furnaces has 8 call numbers, Pigments 10, Electricity 14, etc., showing the extent to which there is want of concentration under *one* call number. Whatever system was adopted, *all* information for the same heading would have to be concentrated at one point, not distributed over so many classes or alphabetical positions. Besides, searching of classes or call numbers should be avoided also from the standpoint of economy, an important item where large quantities of cards are handled daily.

9.—Such direct and rapid access is only possible on the basis of the alphabet, i.e., by the physical structure of the terms, a fixed place alphabetically, not a fixed place or places within a given scheme of classification; and the alphabetical terms can only be those bearing the actual information, not classes or subjects of classifications, titles, etc. Direct access also requires that all terms be used in the singular where there is a singular; further, that inversions of terms be absolutely ruled out, for these inversions are merely a clumsy attempt at classification. Direct access also means filing under specific subjects rather than under collectives, which has the further advantage that the cards are much better distributed because of the smaller range of specifics; large accumulations of cards occur less frequently

10.—*Concrete and Process.* Commodities unfortunately do not exhaust the list of possible terms for main headings. There are others just as important. They generally express Energy of some kind, as in Labour, Power, Light, etc. However with these the terms of actions can also be used for divisions. Thus for main heading Labour we may have as divisions such terms as Education, Organizing, Testing, Training, etc. Terms of commodities and terms of energies may therefore be put into one class; I have called them CONCRETES, in the sense of concrete existences. In the list they are in capitals. (Inclusion of energy is forced, because commodities comprise latent energy.)

11.—Similarly the terms of actions or verbs may be supplemented very conveniently by adding those implying a state or condition generally, which terms can also be used for divisions of concretes. Such terms are: Condition, State, Property, Qualification, Industry, Science, Service, Yield, Demand, etc. The two classes of terms, i.e., those of actions and those of states, I have called collectively PROCESSES in the sense of dynamic or static conditions of concretes. To avoid confusion, the process should where ambiguous be stated as a gerundive, i.e., "organizing" in place of "organization," because the latter may also have a concrete meaning.

12.—Our card index thus contains terms of concretes as main headings and main filing terms, and terms of processes as divisions or subsidiary filing terms, each card bearing a concrete and a process term thus:

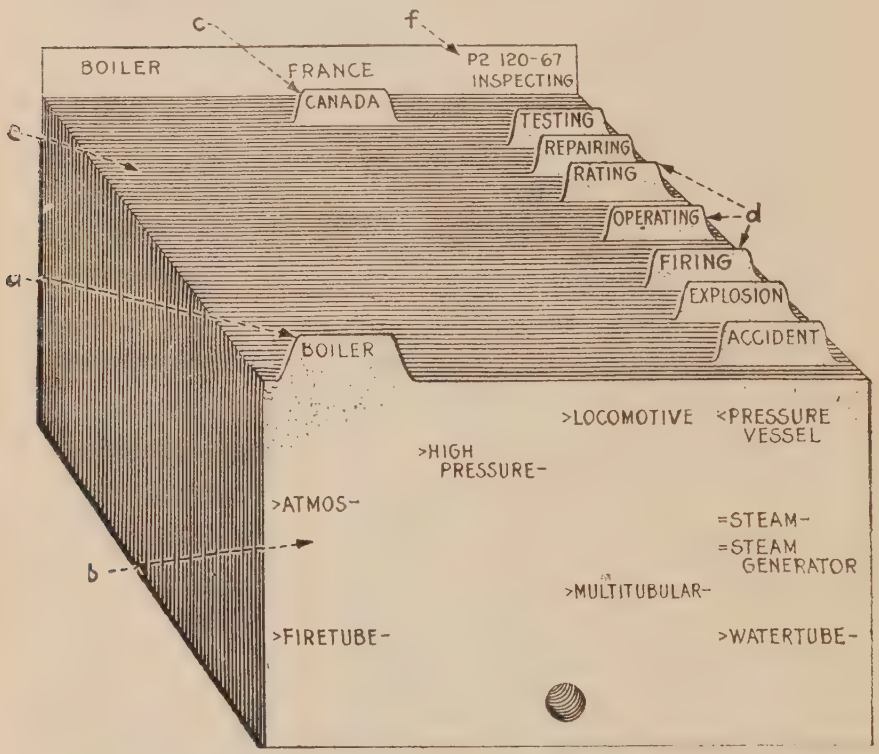
AIR...circulation
COAL...combustion
COAL...consumption
COAL...transporting
FACTORY...ventilating
GAS...absorbing
LAND...draining
PETROLEUM...analysis
WATER...filtration

This arrangement puts an effective stop to the mixing up of concrete and process terms. At the same time concrete and process together form a short phrase, something like a unit piece of knowledge, which gives much more definite information than a subject by itself, and helps to make the information on the cards also more definite.

13.—*Related Terms.* Assuming that our cards are in position and arranged as described, then we still require to connect them up. For this we do not use cross-references, but related terms, i.e., commodities are connected among themselves and energies are connected among themselves. All our main headings are either commodities or energies; the connecting up is therefore strictly limited to comparable terms, which again saves work and results in much clearer linking up. Instead of using an intricate classification for connecting up, we treat the concrete terms somewhat like geometric magnitudes, i.e., one compared with another is either equal, greater or smaller, in the extent

of its meaning; if equal, then we call the terms Synonyms and prefix the equal sign; if greater, then we call the terms Higher Collectives and mark them $<$; if smaller, then we call them Lower Specifics and mark them $>$. For every concrete in the card index there is a first guide on which these related terms are tabulated, as shown in the figure following:—

14.—*Central Index Unit.*



15.—This figure shows the concentration at one point of all the information in the index on one concrete, Boiler (written at the left upper corner of each card).

(a) The concrete term Boiler is shown on the tab of the first guide, indicating the alphabetical position of Boiler in the Central Index as a whole.

(b) In the body of this guide are tabulated the related terms and logical connections of Boiler, so far as they exist in the index; the dash after the terms stands for the term on the tab, Boiler; the signs preceding the terms indicate synonyms, higher collectives and lower specifics.

(c) The centre guide, Canada, indicates division of Boiler cards by countries (countries have not been mentioned because they do not lead to any difficulties).

(d) At the right are the process terms (indicated by fifth guides) in alphabetical order dividing the cards with Boiler as concrete (and without country term).

(e) The index cards are of various colours indicating the class of documents from which the information they bear is drawn; for instance, white cards to indicate books, buff cards—periodicals, green—correspondence, etc. Hence also the term Central Index.

(f) At the end an index card is raised in position showing that the positions of the filing terms correspond to the positions of the guides; also the place of the call number referring to a specific document, the page on which the information appears being added after the dash.

I have selected the term Boiler to draw attention to the fact that the meaning of the same term may vary with each business. Thus, in a plant driven by electric power supplied locally, Boiler would be a specific term perhaps good enough for very casual indexing. In a plant producing its own steam it would have a much broader meaning, and indexing would have to be much more specific. In a plant manufacturing boilers, the term Boiler would literally mean a whole library. This variation of supposed invariables is one of the stumbling-blocks of fixed classification; it requires an elastic system like the alphabetic.

16.—*Terms v. Subjects.* Having given you a general idea of the Central Index, let me go a little more into details. In a book classification we have a number of main headings with successive divisions and subdivisions; in systematic indexing we have one class of terms for main headings—and all our headings are main headings—and another distinct class of terms for divisions, i.e., we are concerned with classes of terms, not with classes of subjects. Subjects of book classifications are made up of various classes of terms which constitutes one of their main troubles, as we shall see presently; concretes and processes are all mixed up, and we can continue to sub-divide indefinitely. In systematic indexing, concretes and processes have been brought into relation so that they cannot be mixed up, and there are no endless subdivisions; concretes are simply divided by processes. In book classification it is practically impossible to concentrate at one point without a large amount of duplication. In systematic indexing concentration is automatic and ample, as shown by the figure.

17.—*Extent.* As we are dealing with terms, we must at least have some idea as to the extent of possible terms in order to make arrangements accordingly. The Dewey Classification contains under 40,000 subjects, and the Relativ Index and the A.L.A. Subject Headings even less; the Brussels Index (Index Alphabetique Général, fasc. 34a 1911) contains about 33,000, and they are supposed to cover the entire field of knowledge. The Century Dictionary (without supplement) gives about 350,000 terms; subtracting prepositions, adverbs, etc., there probably remain some 250,000 terms of concretes and processes. But

Schlomann's Dictionary on Spinning alone contains 19,000 English terms, or about one-half the number in Dewey; that on Electricity 32,000, or nearly as many as the Brussels Index. Richter's Lexicon of Carbon Compounds lists 150,000 separate compounds! In both Dewey and Brussels the subject Carbon Compounds is given one whole number, 547, out of a possible 1000 numbers; on this basis there should be 150,000,000 terms for the whole field of knowledge, which is very likely an exaggeration, but we are quite safe in saying that there are some millions of possible terms for indexing.

18.—Fortunately in any given business we are only dealing with a fraction of this amount; but even so, the number of possible terms is so large that we must make every effort to exercise the utmost control and so keep down the number of cards. Besides, the more cards saved[2] the more concentrated and compact our information in the index, leading to increased efficiency all round. In coupling concretes and processes we at any rate save the great majority of cards made for process terms, and yet the information under each concrete term is complete. For effective control of large numbers of cards it will be found also that the simplest terms are the most suitable.

19.—*Related Terms.* Main headings are limited to terms of concretes. Before any concrete term (and therefore a first guide for it) is admitted to the Central Index, it is carefully considered in all its bearings, definitions, connections, etc. (In case of doubt it is held back.) This is necessary for proper connection and classification and for maintaining utmost accuracy in the index and giving it practically mathematical precision. As explained, concretes are connected among themselves for synonyms, higher collectives and lower specifics. These connections may be made in stages as necessary or suitable for the business the index is to serve, and they will differ with each business. Finally the higher collectives may be cumulated in highest collectives, such as Labour, Material, Product, etc., the common main classes of most businesses.

20.—Terms of commodities and of energies each form a class of comparable terms; by means of related terms we may thus combine them in as many logical classifications as may be called for by our business interests. We can choose these connections or classifications in strict accordance with our business needs, and we are of course presumed to be expert in our own business. Take any commodity: it has a number of properties, and may be viewed from a number of different aspects. Logically it belongs to just as many classes or classifications as it has aspects. For the technical men using the index it is obviously most desirable that all these aspects should be readily known; hence they may be tabulated on the first guide so as to concen-

(2) I entirely agree with one of my reviewers [Mr. Kaiser is author of "*The Card System at the Office*," and "*Systematic Indexing*."—(Ed.)] who says: "We cordially commend this book to those who use or think of using the card system, but we implore them to keep a tight hand on the cards. The little creatures multiply like rabbits, unless rigorously controlled; it is almost worth while to offer the staff a bonus for every card that they can prove to be superfluous." (*Electrical Times*, May 13, 1909).

trate that with other information at one point. Any classification proposed by research men using the index can be incorporated with the related terms.

21.—Related terms therefore serve a most important purpose in showing what positions a given concrete occupies among its own class or classes; every related term represents so many index cards, which, if need be, may be drawn upon for additional information. Process terms do not show relationship of concretes, but rather modifications to which they are subject. Related terms and process terms together give an absolutely complete picture of every possible phase or condition in which a given concrete may be involved, so far as the information in the index goes. Related terms also cover to some extent the subdivisions given in classifications, and what are known as cross-references; but related terms are the only ones strictly comparable.

22.—*Weak Points.* Having shown you some strong points of systematic indexing, let me also point out its weaknesses. As stated, terms are divided into concretes and processes. However, our language is a very heterogeneous mixture of terms; it so happens that it actually comprises terms made up of a concrete term and a process term. In the list you will find AGRIculture and BACTERIology belonging to this class. How are we to deal with these? If they were admitted into the index like concretes it would upset the entire arrangement; we should be forced to fall back on a mixture of terms as used in book classification, from which I have been trying to escape at all cost. The only way open is to cut these terms in two, separating them into concrete and process, although I dislike interfering with terms as given. Thus Agriculture etymologically means "LAND...cultivation"; for Bacteriology we may use "BACTERIUM...science" or "BACTERIUM...study," etc. This applies to terms ending in -ology, -ography, etc. The matter is not serious, however; nearly all these terms are of such a general character that they rarely come up for indexing.

23.—It may even be argued that "using the axe" tends to improvement. Thus, Agriculture implies a host of things. It is of no use in an index. Much better to split it up into "LAND ...cultivation," "CATTLE...raising," etc. Or, take a somewhat extreme case, Zoological Geography, also known as Geographical Zoology. These subjects contain two concretes and two processes each; they may be translated "animal-discussing description of the earth," or "globe-describing animal study." Why is the plain English "ANIMAL...distribution" not satisfactory? It is shorter, more manageable, and has a more definite meaning. I will readily admit the euphony of the Greek terms, but one would hardly put down the plain English as a cacophony. In filing euphony is of no assistance whatever; simplicity is what makes a large index manageable; complicated terms like these usually make good hiding places in an index for all kinds of information of doubtful meaning and utility.

24.—Again, concretes have been defined as commodities plus energies and processes as static plus dynamic conditions of

concretes. Or we may take Space, Time, Matter, Motion and Force in Herbert Spencer's *First Principles,* in which case concrete comprises Space, Matter and Force, and process comprises Time and Motion. However, the terms concrete and process are not entirely free from objection. Furthermore, although we may take the -ologies as perhaps satisfactorily accounted for, there still remain certain terms which are neither concrete nor process. These are mainly mathematical terms such as Coefficient, Constant, Factor, Ratio, etc. Of course, I might say: "Exceptions prove the rule," and content myself with that; but in systematic work this way of reasoning would be fatal. To my mind one single exception proves that the rule is *no rule.* Here then is a weakness in my scheme.

25.—Let me state the original problem as it appeared to me; maybe you can suggest improvements or even formulate an entirely new scheme free from difficulties. Given a vast number of terms; the problem is to divide them into a very small number of classes so that there shall be no overlapping between the classes and yet so that all the terms are completely covered and if any relation can be established between the classes, so much the better. I am still hoping that some way may be found to incorporate the few mathematical terms and at the same time make the definitions of concrete and process more precise. In the meantime mathematical terms can be treated separately.

26.—*Dewey and Brussels Classifications.* Both Dewey and Brussels, especially the latter, are used and recommended for indexing besides cataloguing; let me show you some objections from the standpoint of systematic indexing. As stated, subjects of book classifications are made up of various classes of terms, concretes, processes, -ologies, etc. Confining my remarks to concretes and processes, we may again take Combustion of Coal. The list shows that there are 19 call numbers for Coal and 6 for Combustion, which certainly does not look promising for concentration of one subject under one number. Assuming however that there is only one call number for Coal and one for Combustion, as it should be, then it can be demonstrated that there is still unavoidable duplication even between these two. For as long as there is a heading Coal and a heading Combustion, some information on combustion will be under Coal and some information on Coal will be under Combustion. Let me put it another way; information under Coal is incomplete as long as it excludes Combustion, and information under Combustion is incomplete as long as it excludes Coal; it is physically impossible to separate them absolutely, for combustion is one of the major processes of Coal. Even Dewey numbers bear me out: 621.182 is used for Fuel and for Combustion, 621.1331 is used for Fuels and for Combustion.

27.—This objection holds not only for Combustion but for all other processes bearing on Coal, and it applies not only to Coal but to all concretes as long as the classification contains processes applicable to them, i.e., it applies very generally. I hope you will appreciate better now the great advantage of coupling

concrete and process and making one subordinate to the other, for in this way the general objection just mentioned has been overcome very effectively; it enables us to concentrate accurately under concretes, and overlapping between concrete and process is rendered harmless.

28.—Further, you will recognize that this objection reacts rather unfavourably on the call numbers. Most terms in book classification are incapable of exact definition; to represent indefinite subjects by exact numbers is in any case an expedient of questionable value, for we may be misled into thinking that our subjects are as exact as their call numbers, and by mistake act accordingly. But if, in addition, we have exclusive numbers representing subjects which can be shown to overlap, as with Coal and Combustion, etc., then the call numbers cease to be of practical utility; they are not only misleading but "make" work rather than save it. They should be rejected also because much greater accuracy can be secured with the alphabet; besides, an alphabetical key is necessary in any case where call numbers are used, as in the Brussels system.

29.—Again, assuming for the sake of argument that all process terms have been eliminated from the classification, or even that only strictly comparable terms remain, there is yet another difficulty leading to duplication, and it is this: the so-called classification is in reality nothing more than a set of pigeonholes, 1,000 altogether, among which the subjects are distributed more or less forcibly to fall in with an arbitrary number of main classes. That is, in each pigeonhole there is, let us say, one class and its divisions and subdivisions. Now it can be shown that concentration of this kind is invariably accompanied by corresponding dispersion or scattering of subsidiary subjects, for they can be claimed by more than one pigeonhole, i.e., it is impossible to concentrate subjects under main classes without a large amount of duplication of subsidiaries.

30.—Take Iron: it can be claimed by Buildings, Machines, Medicine, Metals, Railways and many other collectives, i.e., it is scattered (in the list it has 32 call numbers). Supposing we concentrate Iron all at one point, then we would have to repeat it under Buildings, etc., so as not to leave these subjects defective, hence duplication. Take Reinforced Concrete Railway Bridge: if there are pigeonholes for Reinforced Concrete, Railways, Bridges, it will have to go into each pigeonhole or we must sacrifice concentration. That is, in an analytical arrangement like Dewey or Brussels, whatever we gain by concentration at determined points we lose again by the scattering of subsidiaries. Now if you will look through the classification you will find that those subjects are concentrated which from the standpoint of indexing are of least use, if at all, for who is going to index "Natural Sciences," "Physics" or similar subjects? On the other hand, the subjects most used in indexing, i.e., specifics are scattered; and the further the subdividing is carried, the greater the scattering and the more duplication.

31.—In systematic indexing direct access requires that we concentrate on specific terms rather than on collectives. By means of the related terms we connect up or down, as required, without any forcing; we concentrate at every point without committing ourselves definitely to either analytic or synthetic sequence. But since processes are attached to concretes which are concentrated, it follows that the processes are scattered; thus Combustion will be found under Coal, Fuel, Oil, etc. However, in many cases nothing is lost by scattering processes, and in those cases where the processes are of importance in our business they are collected in a process section.

32.—Now a few words as to the classification of books proper. I have already criticized Dewey and Brussels to some extent[3] and hope that my criticism will not be construed as antagonism, as is so often the case. It is hardly necessary for me to say that Dewey deserves great credit for the unparalleled impetus he has imparted to library development with his classification and his library schools. But this must not blind us to demonstrable weak points. As we are constituted there is no finality even in the arrangement of books, and criticism is always the first step towards progress. There is no doubt in my mind that the schemes are fundamentally weak[4], and it is especially regrettable that the Brussels Institute is building up a huge superstructure without apparently having tested the foundations, for they are certainly inadequate for it. No book classification has ever been entirely successful and none is likely to be, so far as I can judge, unless a radical change in method leads to better results.

33.—Applying my experience with systematic indexing, I would suggest the following for your consideration. We can look upon a book classification as an end product (to use manufacturers' terminology), in which case the subjects or terms of which they are made up are the prime materials. These terms have certain properties (like any other materials) i.e., some things we *can* do with them and some other things we *cannot* do with them, no matter how hard we try. The first operation in the planning of a classification should therefore be an exhaustive study of the terms (as materials) to find out definitely what can be done with them, how they can be divided into classes, brought into relationship, and what kinds of relationship, connotation, etc. When this has been done satisfactorily, then only are we in a position to think about classification; and it seems perfectly obvious that the classification must be based primarily on what we can do with the terms.

(3) *Systematic Indexing*, par. 243-74.

(4) In explaining the Dewey classification, Prof. Pollard says (in the Report of the Second Conference, p. 37 *et seq.*): "The whole of knowledge is represented by unity; the first ten decimal divisions of unity represent ten great groups . . ." This would certainly meet one of my objections to Dewey and Brussels, i.e., that classification and notation go in opposite directions, assuming, of course, that unity equals 1, and that the ten decimal divisions are 0.9, 0.8 . . . ; but reading on, it is rather disappointing to find that the first primary division of unity is 0.0; the second, 0.1; the third, 0.2 . . . Prof. Pollard might surely have stated at least that in Dewey and Brussels arithmetic 0 equals 1, 1 equals 2, 2 equals 3 . . . To me it is absolutely incomprehensible how any intelligent person can countenance such a wholly unjustifiable perversion of an age-long practice.

34.—You will agree that no manufacturer would think of working his materials until he has found out their properties and how far they are suitable for his purpose, or what he must do to them to make them suitable for turning them into the end product. But in classification, even in cataloguing and indexing, we are apparently quite unconcerned about materials, and simply take them as they come. I am aware that this proposed study would entail a great deal of work, much more than I have done myself in connection with systematic indexing; but I feel confident it would lead to a more acceptable classification than Dewey or Brussels, and in view of the talk about a classification for universal adoption it would surely be worth while trying. Even in your own work you will find that whatever time you spend in the study of terms will have been spent very profitably.

35.—*Filing.* To return to systematic indexing; direct access by concretes is best followed up by direct access to the original documents containing the information, so that if for any purpose a call number has been noted either in reports or as memoranda, each document can be found direct from it; in other words, call numbers must be individual and exclusive; every call number must refer to one document only; the same call number must not be used for any other document nor for any other purpose even in departments outside the library. As to arrangement of documents, the best practice I can recommend is to divide them all into classes by their physical characteristics, such as books, periodicals, drawings, etc., taking great care not to allow overlapping if it can possibly be avoided. Each class is designated by an appropriate letter, A, B, C, . . . In each class the documents are numbered consecutively as filed. For large classes divisions may be made if required. The whole call number therefore consists of a letter denoting the class, a number denoting the division and a number giving the consecutive order, thus : B3.321, B3.322, etc.

36.—The question of most suitable divisions is an individual matter for each business; no universal rule can be laid down. I would strongly recommend however the use of quasi-physical divisions wherever possible, dividing books for instance into official and non-official, dividing by countries or origin, etc. Do not use subjects if you can avoid it, especially if the library is used by researchmen. The objection is that as all research work ultimately boils down to pure classification work, it is against the best interest of researchmen to be tied to any subject classification (even for filing their papers); they should keep an open mind for all classifications as part of their work, not be committed to any one in particular. The proper place for classification is with the related terms; it is their special function to supply not one, but all classifications required; and with them it can be done very accurately; with documents as a whole it is impossible.

37.—*Indexing.* The indexing, like the concretes and the related terms, serves the individual requirements of each business, and is merely concerned with those parts of documents

which bear on the business. Direct access requires that the actual information given in the originals shall be available on the cards of the central index in the form of annotations, i.e., the documents must be read and the information of interest must be abstracted at least sufficiently to enable those using the index to judge directly from the cards whether or not the information warrants reference to the original. We are not concerned merely with copying titles, etc., but with giving the actual technical information under each concrete and process; titles are entirely disregarded. This indexing is done once for all; it requires more time but represents a saving of time whenever the cards are consulted. It also requires adequate technical training and a good knowledge of the business of the firm and its development. Within the range of literature indexed the information in the index must be reliably complete; that is, we want *all* the information contained in the documents, not merely what we may happen to catch from titles, etc. Systematic indexing is like a very fine comb.

38.—*Consulting.* With the Brussels system we first use the alphabetical key to the subjects and find the number of the subject required; with this number we refer to the cards bearing the same number; the cards located have to be sorted out to separate what we want; for the cards selected we find the original documents to which they refer; we must read these documents and sort out again those touching on the required information; before they can be used, they require to be studied to find out what the information given really amounts to.

In using the Central Index we must decide on what concrete information is wanted; this we find in its alphabetical place, where the information on it is concentrated (as shown in the figure). If with the Brussels system no usable information is found, then we return to the alphabetical key and try other subjects and numbers and repeat the whole process each time. In the Central Index we simply look at the related terms for further guidance, and we know that *all* the information is thus made accessible; with the Brussels system it is obvious that only part of the information is available, and that as a result of cataloguing, not of indexing.

39.—*Planning and Operating a System.* Finally a few words on organizing. The laying out of plans is the most important work, for we must be prepared to stand or fall with our system; it will mean either success or failure. Formulation of a plan requires a great deal of thinking; in this kind of work imagination *must* go a long way, and we must bring to bear all the critical attitude of mind of which we are capable; we must act with great deliberation and circumspection; once work is started, we cannot go back; patch work practically means failure.

40.—The first step is to determine exactly what the problem is, what is given in the way of literature and other materials, what conditions have to be met, what results are expected, and

what amount of time is available. It is always best to put these things down in writing for close scrutiny, study, and co-ordination; besides, it will be a useful record to which we shall surely have occasion to refer at some time.

41.—The second step is to examine systems or methods available with a view to determine how far they do or do not meet required conditions, whether a new system should be developed or not, etc. Thorough study designed to arrive at an independent opinion requires that samples should be worked out for a practical demonstration of what can be done with each system, how it must be done, and how one system compares with another when applied to the problem under consideration.

42.—The third step is to draw up a detailed plan of the proposed system on the basis of the first and second steps; for this we must analyze "in cold blood"; hard logic, not predilection or preference must be our guide; we must find an equation for the set of conditions of the first step and the set of conditions of the second step, When the plan is formulated, it should be subjected to the most searching criticism by those who have any interest in it. Criticism must be accepted if it cannot be refuted, but in so doing the organic entity of the plan must not be mutilated or destroyed. It should be understood that if a plan is adopted, no change of any kind can be made in it for a number of years and even then only rarely and for ample reasons.

43.—The fourth step is to carry out the plan agreed upon with the greatest consistency of which we are capable, maintaining a never failing watchfulness over the development of the system; if we do not it may run away with us; we may be merely keeping up a system, and the service it is to render will take second place. A careful record should also be kept of any developments, changes, etc., relating to the system and its operation. It is only by knowing exactly the road we have travelled that we shall be able at any time to determine whether any proposed change, etc., would be consistent with the system as a whole. If no record is kept, then control ceases to be effective, and the system will deteriorate.

44.—In concluding I trust that my brief explanations and criticisms may stimulate original thought leading to progress in the development of effective library service.

In the absence of Mr. Kaiser, the above paper was presented by the Chairman, Mr. W. Barbour, M.A., B.Sc., Nobel's Explosives Co. Ltd., Ardeer.

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Mr. P. K. TURNER, A.M.I.E.E., M.I.R.E. (Burndept Wireless Ltd.), in discussing this paper said that he had to express his great regret for the absence of the author especially because some of the points which he had to raise seemed to need an answer.

Firstly, of course, one must distinguish between the arrangement of *matter* (books, cuttings, etc.) and the arrangement of an index to them.

If any non-alphabetical scheme of arrangement were adopted, either for matter or abstracts, it was, of course, useful to have an alphabetical index to the main classification: but he understood that the Kaiser system was essentially one that was alphabetical throughout.

On that basis, then, he asserted that the whole system was fundamentally wrong. It appeared to be directed entirely towards easy *preparation* and disposal of the references by the indexer, rather than towards easy *use* by others—perhaps a natural tendency on the part of a professional indexer, but hardly, he thought, to be encouraged.

Mr. Turner suggested that it would be probably helpful if, instead of making general remarks, he took in order, some of the points in the paper which seemed open to question.

He instanced the following sentence in paragraph 2:

> 'It was rather weak, the main trouble being duplication, i.e. the same information could be found under several headings (not counting localities), which made it obligatory to search the cards under all likely subjects so as not to miss desired information. Duplication of this kind also occurred in the dictionary catalogue, but to a less degree.'

Just what did this mean? *If* the same information could be found under several headings (as, indeed it ought to be) it was obviously *not* necessary to search under all likely subjects for it.

Passing over paragraphs 4 and 5 (though he added that he found material there for criticism) he examined 6. Here the author lamented that, using Dewey, certain information (i.e. on Combustion of Coal) might with equal propriety be filed under "Coal" or "Combustion." It seemed to him absolutely essential that it should be filed under both. Under the Kaiser system, "combustion" was only found as a sub-heading under every fuel listed in the index. But his experience led him to the view that inquiry for "all material on combustion" would be just as frequent as inquiry for "all material on coal"; and the system failed to meet this demand without excessive labour: in fact, it appeared that, in actual practice, users of it found themselves compelled to set up separate indices for these "process" headings!

The last sentence of paragraph 7:—

> 'Besides, nobody would expect to find information on Combustion generally in an index, but always combustion of something, i.e. a commodity'

was simply untrue.

In paragraph 9:—

> 'Such direct and rapid access is only possible on the basis of the alphabet, i.e. by the physical structure of the terms, a fixed place alphabetically, not a fixed place or places within a given scheme of classification'

the author begged the whole question at issue.

In Mr. Turner's experience, some systematic classification was superior to any alphabetic one for this purpose.

Passing now to the illustration of cards in Paragraph 13 of the paper, one was struck by the elaboration of "Higher collectives," "Synonyms," and "Lower Specifics." The whole of these, of course, were already inherent and ready-made in a logical classification, and, moreover, material of such allied kinds was automatically filed close together, a point of overwhelming practical convenience.

Paragraphs 16 and 17 were typical of the author's point of view, and appeared, from Mr. Turner's point of view, particularly unsatisfactory. Mr. Kaiser rejoiced (in paragraph 16) that in his system there were "no endless subdivisions." But this itself seemed to him to damn the system; for it set a limit to its possible extension. If one were to be able to deal, in any desired detail, with any subject, one needed "endless" subdivisions.

They caused no trouble, and allowed of accurate classification. Again, what relevance was there in the facts that Dewey contained 40,000 headings and the Century Dictionary 350,000 words? One was classifying *things* and *ideas;* not *words,* which were merely the tools of our work. *But* if one wanted a class for every word in the dictionary, Dewey could provide it—as, indeed, could any logical classification.

In Paragraph 18 again, one came on the traces of the index *maker* as distinct from the *user* :—

> 'Besides, the more cards saved the more concentrated and compact our information in the index, leading to increased efficiency all round.'

This was basically wrong. For *use,* the index must give reference to an item of knowledge under every reasonable heading to which reference might be made; compactness was not a virtue if it meant fewer entries.

It seemed that the author could not really have grasped the essence of bibliography. He said, in paragraph 25 :—

> 'Given a vast number of terms; the problem is to divide them into a very small number of classes so that there shall be no overlapping between the classes and yet so that all the terms are completely covered.'

But in an actual majority of instances, items to be filed or indexed dealt with *relationships,* often between two subjects wide apart from every point of view except one. The whole idea of classes with no overlapping was hopeless from the start, and one must make provision (as was well done in the Brussels index) for entries whose essence was in the fact that they appertained to two or more subjects.

What did the author mean, in Paragraph 28, by "indefinite subjects?" He could not conceive of any item of information, worthy of filing (except under "philology" or "belles lettres") which had an indefinite subject, and was constrained to believe that Mr. Kaiser meant either one that did not fit his scheme, or one that the indexer was too lazy to investigate and classify. The whole of this objection to logical classifications seemed to fall to the ground.

Mr. Turner passed over several other points which seemed to him to indicate that the author, in spite of his experience, had failed to grasp the real principles of the Dewey and other logical classifications, and concluded by quoting from paragraph 32 :—

> 'There is no doubt *in my mind* that the schemes are fundamentally weak.' [The italics are Mr. Turner's.]

For his part, it would seem that the fundamental weakness was not in the schemes, but—elsewhere!

Mr. R. BORLASE MATTHEWS, Wh. Ex., A.M.I.C.E., M.I.E.E., F.R.Ae.S. (Consulting Electrical Engineer), said that while he had always admired the great ingenuity and extreme skill shewn in the Kaiser method, he did not regard it as suited to any but the larger libraries where expenditure on indexing staff was not of immediate importance. Even there the indexing was individual in character rather than general. For purposes of the smaller library and bureau of information which could not afford heavy expenditure on its indexing there was nothing to equal a system that had already been published and tested such as the Dewey Decimal Classification embodying the improvements of the International (Brussels) system.

Admittedly specialized extensions might have to be carried out in addition to suit a highly specialized library or file. This done, the ideal state of affairs, involving the minimum expense was not to index at all, but to depend upon the published volume and the specialized extension. In this way, any form of card or loose-leaf index was eliminated and data could be got into their place very much more quickly. A certain amount of cross-indexing would have of course to be done where the printed or typed guides had not sufficiently anticipated the need. Mr. Matthews mentioned that he had worked on this principle with great success for many years. The only objection was that there was no definite accession list (though even this could be prepared on a classified method if

considered essential), coupled with the fact that a certain amount of trust must be placed in those who consulted the files. Anything borrowed was of course charged out in the ordinary way. Simplicity, speediness, effectiveness and economy in its filing methods must be the keynote of the modern industrial special library and information bureau.

The CHAIRMAN said that they had read in the paper by Mr. Kaiser an account of the circumstances which led him to devise the scheme of indexing termed by him "Systematic Indexing," better known, perhaps, as the "Kaiser System."

In the following notes he (Mr. Barbour) had embodied the conclusions regarding this system which had been reached as the result of almost fourteen years' experience of its application.

Their Central Index was worked in conjunction with a Dictionary Catalogue which dealt with books and pamphlets only. The library was responsible also for the Drawings Index, which was situated in the Drawing Office, and for an Equipment Catalogue which gave particulars regarding the location of all pieces of laboratory apparatus and of certificates of standardization or other information concerning apparatus which they had on their files.

He said he would deal more particularly, however, with the Central Index which was concerned with all scientific and technical information which reached them from sources other than books and pamphlets.

He was associated with Mr. Kaiser for about two and a half years, and saw and took part in the starting of the index, and was much impressed by the extreme care with which Mr. Kaiser collected and surveyed the considered opinions regarding the scope of the index of all members of the staff holding responsible positions. He was most careful to weigh the possibilities either of failure to cover completely the whole of the ground in which they were interested or of expending useless effort in indexing information of little or no value. At the beginning, and for some time afterwards, they were guided, in cases of doubt, by the members of a committee appointed for the purpose. Every case was fully debated and every decision was recorded in a small "Key Cabinet." It would be true to say that the scope of the index was defined by the members of the staff after adequate consideration stimulated by the alert cross-examination to which they were subjected by Mr. Kaiser and guided by the results of his previous experience. The responsibility for decisions lay with the management and the decisions themselves were recorded. Gradually, however, reference to the committee was less frequently necessary, and it was ultimately dissolved; for many years now decisions had been made by Mr. Rintoul, the Manager of the Research Section, or by Dr. Weir, the Assistant-Manager.

It seemed hardly necessary to say that the management, to whom the inception of the index was primarily due, and under whose active direction it took shape, shared justly in the pride of achievement. They were unsparing in their efforts to promote efficiency and the library staff never lacked effective help in times of difficulty. So much for the starting of the index.

Mr. Barbour said he had mentioned the difficulty which arose from the beginning in connection with the limitation of the scope of indexing. It was a difficulty which never disappeared, and he thought that the best possible way of indicating their method of dealing with this difficulty was to read a portion of a memorandum on the scope of indexing written at the request of Mr. Rintoul about two and a half years ago:—

> "At various times since the Central Index was inaugurated the question of modifying the scope of indexing has been brought up for consideration, but in one case only was a minute recorded authorising appreciable extension of the scope of indexing. In this case the degree of extension was strictly defined.
>
> It will be remembered that this extension was made possible by a change in the routine of indexing. I refer to the adoption

of the practice of indexing from abstracts information on all matters except explosives which appears in journals subsequently bound, the previous practice having been to index all information directly from the original article.

At the same time it should be made clear that no written description of the scope of indexing has yet been attempted and that items of information are constantly encountered which could not possibly be legislated for a priori. The procedure adopted was that of reference to heads of departments for decisions regarding suitability for indexing, and though this becomes less frequently necessary as years go by, it is still resorted to in case of doubt.

As the result of eleven years' experience, however, an attempt may be made to give an outline of the ground covered.

(1) All matters pertaining to explosives manufacture, to storage of explosives and to certain matters connected with their transport and use. This includes accidents in manufacture and transport, and some accidents in use, but does not include the very numerous accidents which occur in ordinary blasting operations, which are, for the most part, due to deliberate or unintentional breaches (1) of regulations laid down by authority or (2) of the canons of common sense. It includes also all operations subsidiary to the manufacture of explosives at Ardeer, e.g., acid manufacture, and most of those subsidiary to explosives manufactured elsewhere. Manufacture of products involving use of N/C, such at N/C artificial silk, N/C varnishes and enamels, celluloid, N/C solvent recovery, etc., are also included.

(2) Information on matters affecting the Engineering Department selected by the latter.

(3) Such information of an academic nature as will prove useful to the laboratories of the Research Section in the work of controlling purity of raw materials for explosives manufacture, in controlling quality of intermediate or final products, in developing new methods of manufacture or new products, in modifying old methods, and generally in working out new ideas connected with the manufacture, transport, storage and use of explosives.

The Central Index is thus essentially that of a firm engaged in explosives manufacture.

While this is so it is also the case that in a very restricted area, that of patents, the scope of the Central Index is wider. The scope of the Dictionary Catalogue which deals with books is wider still.

In the case of patents and books most of the activities of Nobel Industries, Ltd. (which are of a chemical nature, except those involved in the metal industries), are provided for.

In deciding the question of extension of the scope of the Central Index, the following points should be considered:—

(i) the degree of permanence of interest in the matter under consideration. To index for a time and then to cease to index is to invite the development of an index of shreds and patches which would provide much disappointment for those consulting it, and would ultimately bring the system into such disrepute as to diminish very seriously the value of all the labour hitherto expended on it.

(ii) the increase of work involved for the Library Staff. The present staff is very fully occupied. Would the proposed extension involve extra expenditure and would this be justified? Could the indexing be done by members of the Research Staff concerned?

(iii) the possibility of covering requirements by Ardeer reports, external reports, books, patents and such extra journals as may be judged necessary for the purpose in hand without indexing the latter in the Central Index, except in so far as they may contain information of value on subjects already indexed as a matter of routine."

In continuing, Mr. Barbour said that two other phases of index control would be dealt with at that point as briefly as possible, viz., control of the numbers of cards and control of "Related Terms." Some time ago he had tabulated the figures for annual production of cards and found that in spite of a considerable increase in the number of journals taken as compared with the number in 1913, and in spite of appreciable widening of scope of indexing, the number of cards produced per annum was not greater then than at first. It would be premature to draw any conclusion from that fact however since during the early years they had tackled and completed the indexing of all back reports and of many old patents and journal articles. He wished to emphasize the fact, however, that they had made every effort to cut down the number of cards to the minimum, which would leave efficiency and speed of consultation unimpaired.

Control of Related Terms was important also. It was easy to elaborate too much, though it was necessary to guard against omitting useful connections. It would probably be sufficient to say that as the users of the index were for the most part graduates in chemistry it was superfluous to connect "aniline" to "amine" or "base," or "mannitol" to "alcohol."

So far it had been seen how the Ardeer index grew and how its efficiency was maintained. Perhaps a few words about costs would be appropriate. The total cost at present of the indexes and catalogues which he mentioned at the beginning, i.e., the Central Index and Drawings Index and the Dictionary and Equipment Catalogue was about £1,380 per annum, say about 26 per cent. of the total cost of the library services. This figure included salaries, wages, furniture, stationery, repairs to typewriters, everything which was chargeable to indexing proper as distinguished from other library work. The users of their indexes included 58 Research Department Chemists and Physicists, 78 members of the Research Department junior staff together with the Manufacturing Department Chemists (21), and the members of the Engineering Staff (17). To those must be added the members of the staff of the Technical Department of their Head Office who were located in the immediate neighbourhood and consulted the index usually by proxy (20). Inquiries from a much wider area were stimulated by the weekly circulation at home and abroad of their Library Notes, containing reproductions of the representative index cards for the week. The library staff itself comprised four senior members, in addition to himself. All were graduates. One had had experience in the technology of gas manufacture and manufacture of chemical warfare material and had special qualifications in bio-chemistry. The second was a physicist and had high linguistic qualifications. To him was assigned the work of translation. The third had a long record of service with the company in the manufacturing departments and acted as Editor of Reports. The fourth was concerned chiefly with work connected with patents. The clerical staff numbered 12. The total library staff numbered 17.

Those who had had experience of the working of the Kaiser system knew that it entailed hard work for the staff. If speed in consultation and quick comprehensive assembly of specific data were to be secured a corresponding amount of work must be put into the index. The amount and quality of that work determined the cost. To say that some other system was cheaper was to challenge their serious attention. They wished to know what this cheaper system would do. If it would give similar service at a smaller cost they would be glad to consider it. He had made the suggestion through the secretary that this question of comparison of costs and services of systems of indexing might fittingly occupy the attention of a special committee of this Association which could collect

data and issue a report. Mr. Barbour pointed out that their costs did not set a standard. A small index worked on the Kaiser system could be very efficient and could be worked at a cost corresponding with its amplitude. It would still require serious work, but not more than was commensurate with its size and the service to be given by it.

He then turned from the Ardeer Index to consider shortly a few questions of more general interest arising out of Mr. Kaiser's paper. It was a fact that the Kaiser system had given splendid results when applied to business, technology and science. He had written to Mr. Kaiser recently and put to him the question of the applicability of his system to the more abstract subjects such as religion and philosophy. He had in his mind the fact that the indexing of information on these subjects would involve the use of a very high proportion of "process" terms and of a relatively small proportion of "concrete" terms. He was aware that in Mr. Kaiser's book, *Systematic Indexing,* he contemplated the possibility of having to index entirely by processes. In paragraph 653 of that book the following passage occurred :—

> "At the same time cases do arise where indexing by processes becomes necessary, for supposing our system were confined to one specific commodity, in that case we should index by processes altogether."

In his reply Mr. Kaiser stated :—"My system can certainly be applied to religion, drama, philosophy or any other branch of knowledge. There may be some difficulty at first to locate the 'concretes' and 'processes,' but this would only be temporary." Speaking for himself, Mr. Barbour did not see any difficulty where "process" terms predominated. They could be subdivided quite well according to the "concrete" terms concerned with each "process." Indexing in this way would be the reverse of the procedure adopted where the filing terms were names of "commodities" or "energies." They found themselves that the "process" section of their index was very valuable, i.e., a separate section in which cards were filed without any amplification in the following way :—

	Sensitiveness to Shock.
of Guncotton	21.2376-15
of Lead azide	E5971
of Trinitrotoluene	P36.2-275

Their index was one in which "concretes" were used for filing terms and cards bearing similar "concrete" terms were filed according to the alphabetical sequence of the "process" terms. The separate "process" section was limited to a definite relatively small number of "process" terms (287).

There would be cases where the number of cards filed necessarily under "process" terms was of the same order of magnitude as the number of those filed under "concrete" terms. Those cases would be rare however. He thought that the only satisfactory method of dealing with such a case was to keep the "process" section, as they did, quite separate from the "concrete" section. In their own case the duplication was practically nil, i.e., the type of duplication which Mr. Kaiser mentioned in his paper. He thought it could be kept to very small dimensions even in those rare cases of the type just mentioned. The amplification or abstract of information could be given under a "process" term if necessary.

Still another method of working was to file all the cards in one alphabetical sequence using a distinctively coloured card for "process" cards and keeping a record in a separate place of all "process" cards filed.

Mr. Barbour then reverted to the problem of indexing abstract subjects. The term "concrete" might here prove to be replaceable by some other term. It was not unsuitable for their work as standing for

"commodities" and "energies," i.e., broadly speaking for what had an exchange value. It might be worth suggesting that some word might be found to cover a large number of terms which could not fittingly be called "concretes" in their sense of the word and yet were capable of serving as filing terms of a type distinct from "process" terms. They treated Electricity, Heat, Energy and Light as "concretes."

He then passed to the consideration of the development of individuality in indexes and the consequences which that involved.

Every index had a distinctive character if it was constructed to serve an individual or firm having definite interests. The individual or firm he would call the owner. Since owners differed regarding the knowledge they possessed, the facilities they had for acquiring information, the energy they devoted to acquiring and utilising information, the financial resources at their disposal, and the breadth of their interests, it was obvious that even in those cases where for the moment two owners were apparently engaged in similar pursuits the index of one would differ from that of the other.

In the case of the Kaiser system every facility existed for developing individuality, particularly in the matter of choice of related terms, which were characteristic of the owner. The specific nature of the filing terms on the cards was another factor which made for differentiation from the index of another owner. Information with regard to a specific subject was new to one owner, but was not new to another owner; another specific point in the same article might be new to the second and not to the first. The article as a whole might not convey from its title any indication that either of these points was dealt with. But each extracted his little bit of useful information while the man who might be interested in either but who relied on titles and broad methods of indexing would stand a considerable chance of losing both items of information. He said that cases of that type occurred very frequently indeed. The outstanding merit of the Kaiser system was that it provided so easily for selection of useful and rejection of useless information. Useful and useless to whom? To the owner of the index. And who was the owner? An individual or firm or group working in a restricted field each having definite characteristics. It followed then that a central card distributing agency using this system for workers in a given field was peculiarly liable to waste effort, and the same remark would apply with much greater force to a central institution which attempted to index by this system for a clientele the members of which possessed widely different interests. This was a point which he had also discussed with Mr. Kaiser by letter à propos of the position of the municipal or public libraries as regarded indexing. Mr. Kaiser replied:—

> "Municipal or Public Libraries, and Firms or Departments using my system—call the former A's and the latter B's. The B's cover a well-defined field of knowledge, that of the A's is much less defined. With the B's the index *must* be used; with the A's it is merely a matter of probability. The B's can therefore do intensive indexing and do it thoroughly; the A's would do it more or less superficially (not necessarily dyslogistically). With the B's a Central Index is obligatory; with the A's a dictionary catalogue is obligatory. With the B's the Central Index is the main source of information, the dictionary catalogue being merely supplementary; with the A's the dictionary catalogue is the main source and the indexing supplementary. *With the B's inquiries are largely limited to the field marked out; with the A's almost any question may be fired at them at any time.* For the B's my system is suitable: it is designed for them. The A's use the decimal system simply because they use it for the books. If the A's were to use my system, it would put them all out of business for want of funds, and even if they had the funds, it would be a terrible waste to do intensive indexing merely on chance. You see, therefore, that there is no basis for direct comparison. My system has very definite characteristics and should only be used where it actually will be of service."

That statement was quite free from ambiguity. There was in Mr. Kaiser's mind no idea of suggesting that the public libraries should undertake the work of intensive indexing. He said that idea was impracticable. They might infer that the idea of establishing a national institution with an independent staff carrying out the work of intensive indexing on all phases of activity was, in his opinion, also impracticable, an opinion which was probably shared by all present, and yet a National Intelligence System of one sort had already been called for.

In the journal of the Royal United Service Institution for November, 1925, there appeared a paper entitled "Economic Intelligence" by an author who adopted the *nom de plume* "Rousseau." In that paper emphasis was laid on the value, from the point of view of military organization, of a Department of Economic Intelligence. It was suggested that that Department should deal with (i) National Resources, (ii) Industrial Capacity, (iii) Transportation, (iv) Climate of Countries. The value of information under all these headings was demonstrated in very able fashion.

If that Department of Economic Intelligence came into existence it would find that there were many special libraries covering one portion or another of the fields mentioned, so far as this country was concerned at any rate, and a scheme for utilizing their services might be developed without great difficulty. The point he wished to make was that the degree to which the scheme for the establishment of a Department of Economic Intelligence could be made sufficiently comprehensive would depend largely on the extent to which use was made of special libraries; that a central, independent and entirely secret organization would probably fail to achieve its purpose; and that the efforts of a few dozen special libraries which met the requirements of modern business and industrial conditions efficiently were capable of being co-ordinated in such a way as to produce valuable results from the point of view of public safety.

He thought it was not impossible to devise a working scheme for bringing to a Central Institution at regular intervals or spasmodically, on terms to be agreed, duplicates of cards or other records of information bearing on subjects of importance to the nation in emergency, or of importance to certain government departments normally.

In summing up the position as it appeared to him he said that the decimal system was satisfactorily adapted for cataloguing documents and for indexing information in such a broad way that regions in which information might be found were indicated. If the indexers by the decimal system did the same abstracting as was done by the Kaiser system the difference in cost would be simply the difference between the cost of finding a call number and the cost of finding "concrete" and "process." If anything, that difference would be in favour of the Kaiser system. The decimal system was cheaper at first because no abstracting was done. The cost per consultation of the decimal index, taking time expended into account, would be greater. When consultations multiplied the relative disadvantage of the decimal system would increase. The Kaiser index was simple and easy to consult. All pertinent information from all sources could be surveyed, appraised and subjected to critical selection before assembly of the original documents was begun. The time of all consulters of the index was saved at the expense of the extra time spent on one occasion only by the members of the library staff. The system was adaptable for treatment of all kinds of information and no necessity existed for communication with a central authority regarding operating details.

Major E. L. SELLARS (Messrs. Brunner, Mond & Co. Ltd., Northwich) stated that as a result of six years' experience of indexing and abstracting unpublished technical reports he was convinced that the Kaiser system was the only practicable system for the organization of technical information of that nature. He did not know of a single successful attempt to organize such information by means of a scheme which depended only on the organization of the actual reports. An efficient index, in his opinion, was absolutely essential.

Sir FREDERIC NATHAN, K.B.E. (Department of Scientific and Industrial Research), said he was glad of the opportunity of testifying to the value of Mr. Kaiser's method of systematic indexing.

One of the first matters he had dealt with on becoming Works Manager of Nobel's Ardeer Factory in 1909 was that of the collection and indexing of published literature and other information available in the factory Library. Their attempts to systematize this work failed, and in consequence Mr. Kaiser was called in. His system was tried and had remained in use at Ardeer since 1910. It had proved so successful, and had become so much a part of the organization that it would, he felt sure, continue as long as the factory itself.

In 1920, some years after leaving Nobel's, he took up work which necessitated the collection and recording of information of a technical character, and again adopted the Kaiser system, and again found it satisfactory in every respect.

He had very little knowledge of the Dewey system and was not, therefore, in a position to criticize it or to compare it with the Kaiser system. It might be that both had their uses, and he thought their respective spheres had been well described by Mr. Barbour.

There could be no question of the importance to students, research workers, writers, professors and others, of information complete, readily obtainable, and up-to-date, and it was the main object of this Association to make information available.

There were many other associations, institutions, societies, etc., exclusive of public and other libraries, both in this country and abroad, with like objects, and their number was constantly increasing. Only a few months ago he had received a communication from the "Union Internationale de la Chimie Pure et Appliquée," telling him that it was occupied in the creation of an International Office of Documentation for pure and applied chemistry.

The existence of so many bodies, with no organized system of co-ordination so far as he was aware, must lead to considerable multiplication and overlapping. Moreover, they classified, catalogued, indexed, etc., by different systems and in various ways, so that there was no clear and recognized method by which the searcher could obtain the information he required.

Sir Frederic said he was much struck whilst listening to the discussion by the diversity of views in this all-important matter and by the number of existing systems, all of which had their supporters. The Brussels, the Dewey and the Kaiser systems had all been referred to, and Mr. Berwick Sayers in a paper he was presenting to this Conference referred to several others.

Speaking entirely as an amateur, and therefore with some diffidence in such a gathering of experts, he ventured the opinion that uniformity in this connexion was very unlikely to result from conferences which were not truly representative even of the interests and views of individual countries, and which obviously in no way represented the views of other countries.

The establishment of an international system for the collection and dissemination of knowledge would in his humble opinion be a matter for the League of Nations.

His suggestion would be that the League of Nations should summon a conference, requesting each Government to send two or three members who would be chosen by the interests concerned, and would act as representatives for their country.

The functions of the conference would be to lay down general principles to be followed in collecting information, and in distributing it subsequently among countries. It would also determine the system of cataloguing, of indexing or of call numbers, to be used internationally, so as to enable the distributed information to be collected together under its appropriate classes.

To prevent multiplication, each country would deal with its own material, viz. :—books, periodicals, pamphlets, patents, etc., and should have a Central Bureau which would receive the collected information and distribute it, say once a month, to contributing bodies, both in its own country and to foreign countries, either to their central bureaux or direct to contributors.

The Central Bureau would retain and classify a complete collection of all information received.

To attempt to cover the entire field of knowledge to start with would be too vast an undertaking, and he would suggest that a commencement be made with Science as defined by the authors of the "World List of Scientific Periodicals."

The actual collection of information would be allocated by the Central Bureaux and those bodies specially concerned with the individual branches of science. For example, Explosives in this country would be dealt with by Nobel's Explosives Co. Ltd., Fuel Technology by, say, the Department of Fuel Technology of the University of Sheffield.

It would be necessary for the information from all sources to be reproduced uniformly, so as to enable it to be transferred to standard size cards. Each item would bear the appropriate "call number" of the international system, and possibly also, for indicating where the original is located, a number indicating country, and a combination of letters on the Monomark system indicative of the library or libraries.

The functions of the Central Bureaux would be very much like those of this Association.

He said he had only indicated the very general outline of a scheme for the collection and dissemination of knowledge internationally. If such a scheme could be established its benefits would be incalculable. The difficulties should not be insurmountable, and the saving in multiplication of work would be enormous.

Mr. M. C. BUTLER, L.R.A.M. (British Esperanto Association, Incorporated), said that it would appear that in using the Kaiser system each librarian had to work out for his own use his own index. This involved tremendous duplication of labour. Moreover, no two persons thought alike or made the same decisions as to terms to be used. This involved difficulties in co-ordination of effort with other libraries.

If arrangement of books on shelves by alphabet or by accession is involved in the system this meant searching in numerous places for all the material to be consulted on one subject.

Alphabetical arrangement in one language was useless to those using another language, and the Kaiser system apparently rendered international co-operation impossible for this reason.

A numerical system on a subject basis, like Dewey, was applicable universally and to all languages and was therefore best for purposes of international collaboration.

Mr. FOSTER SPROXTON (British Xylonite Co. Ltd., Manningtree) thought the Association must learn to walk before it learnt to run. The paper under discussion was "Systematic Indexing." It seemed premature to talk about sending British Delegates to discuss international methods of indexing under the auspices of the League of Nations when the meeting had disclosed such sharp divergence of opinion on the subject. If, for instance, Mr. Barbour and Mr. Turner were sent as British representatives, the result would be chaos.

Dr. J. C. WITHERS (Textile Institute, Manchester, and British Cotton Industry Research Association) explained that in applying the Kaiser system to his particular work, as described by him at the First Conference (page 67), he had found the "process" section to be the one most commonly consulted.

Mrs. COOK (Independent Labour Party: Information Committee) remarked that there appeared to be some confusion. The paper by Mr.

Kaiser dealt with indexing and he referred specifically to the Relativ Index of the Dewey classification. He would seem to be dealing with material already generally classified and to be primarily concerned with indexing this so that the contents of library shelves or files might be instantly apprehended. The criticism, on the other hand, seemed to assume that an alphabetical index meant an alphabetical classification, which was simply nonsense.

Dr. E. E. LOWE, B.Sc., (Leicester Public Libraries, etc.) said he was in perfect accord with Mrs. Cook who pointed out that two distinct subjects had been confused in the discussion—(1) classification and (2) indexing. No librarian who had arranged his books, pamphlets and reports on a classified system, such as Dewey's, would ever go back to an arbitrary alphabetical or numerical method. But experience showed that all classified systems required to be supplemented by an alphabetical index in order to ensure that all existing information should be brought to the notice of the inquirer. Was not the question, therefore, to decide which system of indexing was the ideal one?

Mr. L. C. WHARTON, M.A., (Philological Society, etc.) pointed out that arising out of the remarks of Mr. Rottenburg (earlier in the discussion) the whole question of library terminology was being dealt with by the second Committee set up by the International Congress of Librarians at Prague, and would be fully covered. There was no need for duplication.

For additional information application should be made to the Committee, through Miss Parsons, American Library, Paris.

Mr. H. Rottenburg, M.A., M.I.E.E., (Engineering Laboratory, Cambridge University, etc.) Mr. L. Stanley Jast, (Manchester Public Libraries, etc.), and Miss M. E. Ferguson also spoke.

It was proposed by Mr. P. K. TURNER and seconded by Mr. H. ROTTENBURG that the following Resolution should be put to the meeting :—

> That Section 1 at its first meeting decided to recommend to the General Meeting of the Conference that a committee be appointed to examine and report on relative merits of various systems of indexing and classification.

The Resolution was carried by a small majority.

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In reply to the discussion Mr. KAISER wrote later and pointed out in regard to Mr. Turner that as this gentleman presumably would regard anything he might say as a priori fundamentally weak, there was no call for any reply. Replying to Mr. Borlase Matthews, he stated that his system could quite well be applied to small libraries. The full benefit of the arrangement by concretes and processes could be better appreciated however when an index had been developed to 30,000 cards or more. Further, he wrote that the Dewey and Brussels systems had certainly been tested as to applicability in indexing, as stated in the discussion. He desired to offer some evidence in this direction, by courtesy of The American Society of Mechanical Engineers. Last year, at his suggestion, a set of questions had been addressed to subscribers to the Engineering Index, which included the following :—

> In view of the use you have been making of the Engineering Index, would the addition of the Dewey numbers or the Brussels numbers to each item indexed be of help to you?
> Would the arrangement of the entire Engineering Index by these numbers appeal to you?

About 50 per cent. replied. Of these replies 8 per cent. were in favour of Dewey or Brussels, 27 per cent. were non-committal, and 65 per cent. were against. Some in the last group explained that for their own indexes they had given up Dewey or Brussels, reverting to the alphabetical arrangement.

SOME NEW DEVICES USEFUL IN INDEXING.

By H. ROTTENBURG, M.A. (Cantab.), M.I.E.E.

Précis.

The following devices are dealt with in this paper :—

(1) A combination of alphabetical and numerical filing for documents filed under a name or word in folders, in which the initial letter or initial letter and first consonant determine the section in the file in which the document is filed, these sections being also numbered consecutively. The documents in the section are numbered consecutively as they accrue. In order to obviate the use of an index or decimal system to find any document and to save searching through all the documents in a section a vowel sub-division is used. This is done by making the position of the folder tab indicate the first vowel.

(2) A vowel indexing system to assist finding names, or word titles, in a long list which is not in any particular order.

(3) A method of marking the pages of a document or article so that references to particular subjects can be quickly picked out.

(4) A routine system for cross-indexing books, documents, etc., in which all the copies of the reference are typed at once using carbon paper and different coloured sheets of paper, a system of underlining words being used to ensure each copy being filed under its correct subject.

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(1) *Argument.* Where documents are filed under a name or word two methods can be used. (a) The documents can be filed alphabetically and (b) They can be filed numerically using an index to find the number of any document wanted. "a" is the quicker for finding a document while "b" is the quicker for returning it to the file and is also the more reliable. This has led to various methods of combining the two, some of which were described by Mr. Borlase Mathews before this Association last year.

Proposed method. The file is first divided into a suitable number of sections according to the initial letter and the first consonant in the word, or name. A suitable way of doing this so as to obtain 100 sections is to make 25 main divisions according to the initial, X and Y being treated as one letter. These 25 sections are then further subdivided each into four according as the first consonant in the name, or word, falls in the four groups B to G, H to M, N to S, and T to Z. The numbering of the sections can be best seen in the form of a table.

	First consonant.			
Initial letter	B-G	H-M	N-S	T-Z
A	00	01	02	03
B	04	05	06	07
C	08	09	10	11
D	12	13	14	15
	*	* * *		
XY	92	93	94	95
Z	96	97	98	99

Under such a system Bellingham, Bull, Bolton, Ball and Billington will all be filed in section 05. Donaldson, Daniel, Dingley, Dunhill, Dent in section 14 and so on. Within the section all the folders are filed in the order in which they accrue and are so numbered. In order however to save having to consult an index or to search through all the documents in the section, folders are used with "one-fifth cut tabs," that is to say having tabs in five positions across the top edge. These five positions are allotted to the five vowels a, e, i, o, u. When therefore a document is to be filed under, say, Bellingham, a folder is used with a tab in the second position, for Bull, one with a tab in the fifth position and so on. The tabs would be inscribed "Bellingham 0514," say, where 05 denotes the section and 14 the number in the section, "Bull 0523" and so on. The result is that when we look for a document in its section we have on an average only one-fifth of the documents in the section to look through, while if we know its number approximately we can generally select it at once.

(2) Where titles or names have to be entered in a list in the order in which they accrue it takes time to find a given one. To save time five columns are ruled in front of the list and the initial letter is repeated in the column allotted to that vowel which occurs first in the name or word, the columns being allotted to the vowels a, e, i, o, u, in order. Taking at random names from the list of visitors to this conference and writing them in an irregular order the list would then appear as follows :

a	*e*	*i*	*o*	*u*	
D					Dawson
		H		H	Hill
					Hughes
			C		Cross
S					Savill
		M			Mitchell
	S				Spencer

To find any required name one runs one's eye down the column of the first vowel in the name until one finds the initial letter.

(3) It is sometimes a great convenience to be able to pick out rapidly all the references to some particular subject in a long report, article or such like. This can be done as follows. Vertical lines are ruled down the page; these lines are numbered and the numbers allotted to the names of the subjects mentioned in the report. Wherever the subject number 7, say, is mentioned in a line a red underlining mark is put in the line where it is cut by the vertical line numbered 7. Where a report or document is typed, square ruled paper can be used to eliminate the work of ruling the vertical lines.

(4) Where cross-indexing of books, documents, etc., has to be done it is a considerable convenience to be able to get all the thinking work done at the start and leave the rest to be done by routine work. Let us assume that the maximum required is six cross-references. Pads of six sheets of different coloured paper are made up with carbon paper and six copies of the reference are typed out. The six words under which the reference is to be cross-indexed are underlined. Supposing the colours used are Blue, Green, Heliotrope, Orange, Biscuit, and Pink, then the Blue copy is filed in the page, card, or folder allotted to the first word underlined, the Green in that allotted to the second word and so on. The size suggested for the sheets is 4in. wide and 13in. long, which allows about 10 references on each sheet. The references are stuck on to the card, sheet, etc., as follows: the sheet is gummed on the back just under the first reference, or, perhaps more logically, opposite the reference, and the reference is then pressed on to the card, etc., with a steel straight edge, against the edge of which the remainder of the sheet is torn off, leaving the reference only adhering to the card. Then the second reference on the sheet is gummed and stuck to its card and so on. For gumming the under side of the sheets a special gumming machine has been developed which allows just the right amount of the sheet to be gummed.

In making up pads of 4, 5 or 6 sheets as suggested a simple way is to collate the sheets and grip them in one or two spring letter clips when the lowest sheet can have its end exposed for applying a strip of paste or gum. Then the next sheet is allowed to fall on it and this is gummed and so on. The clips holding the sheets together ensure the sheets remaining collated after gumming together.

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Mr. R. BORLASE MATTHEWS, Wh.Ex. A.M.I.C.E., M.I.E.E., F.R.Ae.S. (Consulting Electrical Engineer), in discussing Mr. Rottenburg's paper pointed out the importance of a good method of indexing, and therefore the necessity for placing all methods on record so that the best for a particular purpose might be selected. The combined alphabetical and nmerical method suggested in the paper was very ingenious and had the advantage that three figure numbers need not be employed until the number of correspondents exceeded nine in each sub-group. After this four figures would have to be utilized as in the method he advocated. As the system was intended for filing the names of persons

Mr. H. BORLASE MATTHEWS Wh.Ex.A.M.I.C.E., M.I.E.E.,

or firms, the main groups should not be set out as by the author, but preferably be as follows:—

B - D F - L M - S T - Z

for this was the average distribution of such first consonants in names in Great Britain. A defect of the system was that an equal number of sub-divisions were provided for each letter of the alphabet, whereas in practice it was found that there were many more names under certain letters, e.g., double the names under B as compared with those under A.

With regard to the vowel system of indexing: while the method suggested was very ingenious, it was interesting to note the fact that the use of vowels in subsidiary indexing had had to be given up as impracticable. Even the selection of the first consonant after the initial letter had its difficulties. Undoubtedly the best method extant for dealing with this problem was that known as the *Russell*. This method even permitted the easy finding and classifying of names that were phonetically similar or which were misspelt or misread. The Russell index concentrated in one place the varied spellings of a name, whereas all other index systems widely separated each variation. The *Russell* alphabet was as follows:—

b (1) stands for b, f, p, v.
c (2) „ c, g, j, k, q, s, x, z.
d (3) „ d, t.
l (4) „ l.
m (5) „ m, n.
r (6) „ r.

a, e, i, o, u, y, w, h are disregarded.

Mr. Matthews said that he had employed gumming machines for a number of years with great success. They entirely eliminated the cockling of paper and also any mess. Though largely employed in the printing trade, very few offices or libraries seemed to have realized the great advantages they possessed. As a practical user of such machines, he greatly appreciated the improvements made in the gumming machines exhibited by Mr. Rottenburg.

SECTION 2 - - - Saturday morning, September 25, 1926.

Chairman:
Mr. C. R. SANDERSON.

THE DISTRIBUTION OF TECHNICAL LITERATURE.

By J. F. Hudson, M.A., B.Sc. (Principal, Huddersfield Technical College).

A little reflection suffices as a reminder of the scant measure of co-operation that has been attained between the different technical and scientific libraries in this country. The subject is vast and complex. Much work is waiting to be done, and in a brief paper it is not possible to cover much of the ground. An organisation is needed which will make it possible for each library to utilise for the benefit of its members the resources of all other libraries. New special libraries of different kinds are wanted. Co-ordination of function and definition of scope should be carefully considered as between existing libraries as well as between those not yet formed. Another desideratum is the establishment of a clearing-house system through which the exchange of duplicates of missing works or parts could be effected.

The question has also important bearings in relation to teaching institutions. In the Pure and Applied Science Departments of Universities and Colleges an adequate supply of books and scientific periodicals such as the transactions and reports of the leading scientific societies is an invaluable adjunct to the equipment. Teachers and advanced students are seriously handicapped by the lack of a good stock of reference books and the up-to-date information that is to be obtained only from current periodicals and journals. To teachers of advanced students and to advanced students themselves access to the recent literature of their subject is a necessity and they should be able to find it close at hand. It is not reasonable to expect them to make good the defects of the College Library at their own expense. The rarer and more costly books it will not be possible for every library to provide. But this difficulty can be met by developing co-operation between different general and special libraries. Borrowing and exchange must not, however, be extended to current numbers of the scientific journals most in demand nor to the proceedings of the more important societies. These are needed in every College as soon as they appear and should be supplied as promptly as possible.

In recent years the development of the Local College has been much discussed in educational circles. The Local College is destined to grow rapidly in importance as the centre and apex of the local system of education, especially in non-university towns, where it will fulfil a function similar to that of the local Civic University in the largest centres of population. During the nineteenth century the Mechanics' Institutes were founded and developed gradually into the Technical Institutes and Colleges of the last generation and the present day. It is now felt that the

Technical Institute should become a local college in the broadest sense: a centre of educational activity for adolescent and adult students, a meeting place for students of all types, whether those who are attracted by disinterested intellectual study or those whose main object is to fit themselves as completely as possible for their chosen occupation. In the Local College all can meet on an equal footing in classes, clubs and societies.

Shortly before his accession to his present office the President of the Board of Education wrote:—

> "Every town to-day needs an educational centre. The form in which such a centre can be established must vary in different parts. In some cases, for example, the Technical Institute is perhaps well adapted to become the nucleus of what we may call a Local College. Historically it is itself the product of free local initiative, having often developed out of the evening classes of a Mechanics' Institute formed half a century ago, and the similar movements of the present day may well group themselves round it."
>
> "The education centre which may ultimately become a real local college is an idea which appeals naturally to local patriotism besides commending itself on its merits to all those who are conscious of the defects and the great possibilities of our national system of education."

A few weeks ago new Regulations for Further Education were issued by the Board of Education, regulations which have not yet attracted the attention they merit and which have entirely superseded the Regulations for "Technical Schools, etc.," that have held the field for so many years.

The larger Technical Institutions are now recognised by the Board as "Colleges for Further Education." The official list of "Colleges" will include those institutions only "which are of major importance in the provision of Further Education." By "College Courses" will be understood full-time day courses of post-secondary standard in (1) Science or Science and Art with or without technological subjects, (2) Arts, and (3) Commerce. In addition to full-time day courses the distinctive work of a "College" will include part-time day courses for employed students attending during working hours and vocational and general instruction through evening classes for qualified students over 16 years of age.

Enough has been said to stress the importance of the future of the Local College. Members of the Association of Special Libraries will not be disposed to question the outstanding value to such an institution of a first-class library.

The Association of Technical Institutions in March last instituted an inquiry into the present state of the provision of Libraries within Technical Institutions. A form of inquiry was sent to every Technical School and College in the country asking for information as to the provision of technical and reference books in the school library; the financial provision made each year for additions or renewals; if the present needs of the students are met adequately by the existing library provision, whether internal or external; if more books are required (a) for general lending, (b) as reference books to be retained within the institution; whether the needs of

the institution are best met by a Central Library within the institution or by a number of Departmental Libraries.

To this inquiry a very complete set of replies was received. It appears that in general the provision of libraries in Technical Institutions is surprisingly limited in extent, and that very small sums of money are allowed each year for their upkeep. Except in the larger Colleges few books of a technical nature are available. The average number appears to be about 300, and in some cases it is stated that the books are out of date and of no real value. Reference books are usually provided in the larger Colleges, but in many of the smaller Institutes the reference section of the library is limited to the use of the staff. It appears that frequently no definite sum of money is allocated to additions or renewals of books, so that a proportion of the grant for apparatus is taken for the purchase of books. In the great majority of cases the average expenditure is between £20 and £30 a year. Most of the answers express the view that the existing provision of books within the institution is entirely inadequate; moreover, that although public libraries generally provide an ample supply of fiction, very few have literature of a technical nature available. (To this generalisation, however, an exception must be made in favour of London, where full use is made of public libraries and the libraries of the various technical and learned societies. The London student has unequalled opportunities for consulting the literature of his subject, and is on this score to be envied by his provincial confrère.) The County Library is used only in a few cases and hitherto little use has been made of the Central Library for Students.

It is the almost unanimous opinion of the Colleges that more books are required on technical subjects both for general reading, and for reference purposes. The main difficulties appear to be (1) lack of money for the initial purchase of the necessary books and for the replacement and renewals needed to keep the library up-to-date; (2) except in the larger Colleges, lack of accommodation for a library even on a small scale. In many institutions the need of a better reading room and of suitable accommodation for quiet study is felt acutely.

The replies received point conclusively to a serious defect in the distribution of technical literature in this country. Our Local Colleges are attended by scores of thousands of young students engaged in industry and commerce, the pick of their generation, keen and earnest, determined to make good, young men who will be leaders in the years to come. Why do we not give them reasonable access to the current literature of their subject? The present dearth of library facilities cannot but be prejudicial not only to the best interests of the individual student but to the progress of technical education in the country as a whole.

The provision of a suitable supply of literature should be regarded as an essential part of the equipment of every scientific and technical department of a College. Workshops and laboratories for experimental work are always looked on as essential. They are generally furnished and equipped adequately, sometimes even luxuriously. But can we be satisfied with the one-sided attitude

that grudges expenditure on one essential element in the complete equipment of an important teaching department, whilst it is prepared to spend without stint on buildings, machinery and other material equipment? Surely there should be a proper supply of literature in the library. Each College should build up and maintain a comprehensive collection of books and journals, properly catalogued, well arranged and easily accessible to readers. A College which fails in this will be failing in one of its primary duties.

Most Local Colleges specialise definitely in one or more departments—one in Woollen Textiles, another in Rubber Technology, another in Pottery Manufacture—thus building up specialist schools that are often unique in character. As these schools grow in efficiency and completeness they will tend naturally to become homes of a series of Special Libraries of peculiar value, and it will be up to those responsible for their control to make the information they contain as accessible as possible to students and other inquirers.

It seems desirable to allocate a certain proportion of the total annual expenditure in each College to library purposes, including under this head the purchase of current scientific and technical literature in the form of journals, proceedings and transactions of Societies and Institutions. After careful consideration, I suggest that at least one per cent. of the annual expenditure should be assigned to the support of the library, but that where the library provision is inadequate, special grants, larger in amount, should be devoted to the library until the deficiency is overtaken.

To supplement the provision available in College and other libraries efforts should be made to establish a Central Technical Library which might make special features of (a) foreign technical publications and (b) out of print sources, serving at the same time as (c) a bureau of inquiry on bibliographical details.

For the satisfactory building up of new libraries supplies of back numbers of many scientific and technical journals will be required, and it is probable that many well-established libraries have gaps in the back numbers of periodicals on their shelves, which they would gladly fill if the opportunity offered.

In *Nature* for May 22nd, 1926 (page 724), under the title of "The Disposal of Scientific Journals," the following letter appeared:—

> "I expect there are many people like myself who are embarrassed by the accumulation of scientific journals, which remain unbound and are so seldom referred to afterwards that they amount to little more than an incubus.
>
> I think many of us would be glad of some help towards getting this literature disposed of to the best advantage. I have myself a large accumulation of unbound issues of the Proceedings of the Royal Society, the Journal of the Chemical Society, Chemistry and Industry, etc.
>
> Perhaps some readers of *Nature* may have found a solution of the difficulty and could give others the advantage of their experience."

This letter indicates a line of work that might usefully be undertaken by the Association of Special Libraries. Could not the Association help people who wish to acquire back numbers of scientific periodicals to get into contact with others who have them for disposal? Such periodicals may have little or no commercial value and are consequently not handled by second-hand booksellers. It is difficult to discover where back sets of papers may be found, but their collection and distribution to the best advantage are matters of first-class importance. Assistance rendered by this Association or any corresponding organisation would be welcomed by those who have literature for disposal and would be invaluable to those who are forming a new library.

* * * * * *

Lieut.-Colonel L. NEWCOMBE (Library Association, etc.) considered that the proviso that any arrangement for the borrowing of periodicals should exclude current numbers was a very necessary one. In reference to the inquiry that was made by the Association of Technical Institutions, it would be interesting to know the general opinion expressed in the replies as to the advantages of a central college library as compared with a series of departmental libraries. (Principal Hudson stated that the replies were fairly evenly divided on this point, though there was a feeling that both a central library and departmental libraries were really necessary.)

He agreed that a Central Technical Library was a very necessary adjunct to the Libraries of all Technical Colleges and Schools, especially the smaller ones. The Central Library for Students already existed to meet that need. The probable explanation of the little use so far made of the Central Library by the Technical Colleges was that they did not realize to what extent it could help them.

It was doubtful whether unbound numbers of journals such as those referred to in the extract from *Nature* were really going to help to build up the libraries of the smaller Technical Colleges unless funds were available to bind the volumes and keep them up-to-date. The value of such parts for filling gaps in existing sets was quite another matter.

Mr. J. WILKS, M.A. (University College, London), said that the remarks in the final paragraph of Principal Hudson's paper led him to suggest that probably many University Librarians were faced by the problem which in his own case was becoming acute, that of :—

(1) completing sets of periodicals in which there were gaps.
(2) disposing of duplicates.

He suggested that lists of desiderata should be circulated and that they should be offered for exchange where possible or for sale.

If any organization was necessary, it might be provided by the Committee on Library Co-operation or by A.S.L.I.B.

Professor F. E. SANDBACH, M.A., Ph.D. (Association of University Teachers, etc.), remarked that after reading Principal Hudson's paper and listening to his observations, it seemed to him that in the first place the Technical Colleges must consider how far they could help themselves and one another—and he wished to say this in no unsympathetic spirit, but because he did not see what could be done to help them as things were at present. Each Technical College should, he thought, first secure from the body that financed it adequate funds for building up at least a useful reference library; the various colleges could also agree to co-operate on lines similar to those followed by the modern universities; and perhaps these organizations might ultimately amalgamate or help each other.

One speaker had suggested an organized exchange of duplicates, through the machinery of the Joint Standing Committee on Library Co-operation. The proposal seemed, in general, an excellent one, and he thought it quite likely that his Committee would be willing to be of

service in this. Such work might well be a first step towards an agreed delimitation of the purchasing of the less essential periodicals, which they had in view as one possible form of library co-operation.

Meanwhile he would like to make it quite clear that his Committee would be happy to make inquiries about the location of books wanted on loan by research workers in technical colleges.

Mr. W. C. BERWICK SAYERS, F.L.A. (Croydon Public Libraries Committee), said that the interesting paper which Principal Hudson had given them raised the fundamental question of library provision in the average town. What, for example, was the place of the library in the Technical College and in the community? If, as some distinguished educationists have urged, the library was the centre, laboratory, and power-house of the technical institution, an expenditure of one per cent. of the income of the institution on that important organism was quite inadequate.

But what he was concerned to ask the meeting to remember was that public libraries and technical colleges were both supported by the municipality and while the college must have its own library to some extent, in the average town the funds to be spent on books should not be used uneconomically; this would be the case for example if such a book as Glazebrook's *Dictionary of Physics* (one copy of which would be ample for the whole of the average town) were placed in the college and its use confined to the students there. If it were placed in the reference department of the public library it would be available at all hours to everyone including the college students. This was emphasized in cases where the public library was next door to, or within a stone's-throw of, the college. There was, again, a statement in the paper, drawn of course from the inquiry made by the Association of Technical Institutions, that while public libraries generally provide an ample supply of fiction, very few have literature of a technical nature available. That statement must be definitely contradicted; it was simply untrue. In the case of his own libraries, out of 160,000 items in stock, only 19,000 were fiction. What, then, were the others? By co-operation with the Principals of the Polytechnics all the books required by the Polytechnics were immediately provided for them, and all students, whencesoever they came were given the freedom of the public libraries. Duplication of expenditure and effort might be necessary in some towns, but in many co-operation would achieve much of that which the author of this paper desired.

Mr. H. GREENWELL, F.S.S., Assoc.M.I.M.E. *(The Colliery Guardian,* etc.), speaking as one partly responsible for the production of a number of periodical technical journals, said his firm had always been willing to supply copies free of charge to institutions and libraries where they were assured that they would be used and that the institution in question was unable, through lack of means, to procure such literature through the ordinary channels. It might be argued that this accommodation might involve a restriction of the publisher's subscription list, but the wise point of view was to regard the student who made use of such literature during his years of pupilage as a potential subscriber in years to come. Naturally, however, it would be in the interest of the philanthropic publisher of technical periodicals if some system of centralization could be devised which would obviate the cost of sporadic distribution.

Inquiries were frequently received from readers for numbers of journals and extracts from listed articles and it would be a great advantage to know where the file of a particular periodical could be consulted locally.

With regard to the binding of periodicals, the publisher naturally liked to think, when he supplied his publications free of charge, that full use was made of them—that they would be bound and filed for future reference. The nature of the publication and the community for which the institution or library catered had also to be taken into consideration. The point was that the publisher should be assured that adequate use was

being made of his publications. The case of the Patent Office Library might be recalled, where owing to the withdrawal of the Government grant large numbers of unbound periodicals had encumbered the shelves, the result being that the usefulness of the library had been considerably curtailed.

Mr. W. B. THORNE, F.L.A., advanced the view that a new attitude towards books and libraries was appearing; hitherto they had been regarded as store-houses of knowledge; the problem now confronting them was to render this knowledge fluid. This suggested a pumping-station, which in the natural course of events would be provided by the central establishment consisting of the various library associations suggested by Colonel Newcombe. A national reservoir was a necessity, but local reservoirs were equally so; the latter would serve the average student, but the specialist would need fuller assistance such as could only be supplied by a central organization, in other words by a highly developed C.L.S. The proportion of specialist inquiries would be small in comparison with the others, but their importance would be relatively great.

Mr. F. K. NEATH, B.Sc. (British Cast Iron Research Association, Birmingham) said that a conclusion to be drawn from Principal Hudson's paper would appear to be the desirability of local co-operation. In most of the large industrial areas there were libraries belonging to technical schools and colleges and to universities, research institutions and scientific societies. In addition there was usually a good technical section to the public libraries; and Manchester and Birmingham were quoted in this respect. As it was quite possible that there would be in these local areas a fairly complete supply of special and general information distributed among the bodies mentioned it would seem very useful if the material available were generally known in the district. In Birmingham, for instance, a list of technical periodicals filed in the local libraries had been prepared by Mr. Ridley of the British Non-Ferrous Metals Research Association and a further extension of this scheme, with possibly an arrangement between the librarians to give facilities, might solve many difficulties. It was quite easy to borrow a single volume through the Central Library for Students, but in many cases a technical worker wished to consult a whole series of periodicals and abstracts.

Mr. Neath disagreed with Colonel Newcombe about the value of back files of periodicals; he found personally that the back files of a really good technical periodical formed a most valuable part of a specialised library.

Mr. W. L. Cooper, M.A., (Bristol University) also spoke.

SECTION 3 - - - Saturday morning, September 25, 1926.

Chairman:

Sir RICHARD GREGORY, D.Sc., F.Inst.P., F.R.A.S.

RESEARCH AS AN AID TO BUSINESS MANAGEMENT.

By W. A. COOKE, B.Sc. (Econ.)

(President, Business Research Association of Great Britain.)

The term Business Research is comparatively new in this country. It provides, with such terms as "Sales Management" and "Merchandising," the convenience of a well defined and comprehensive title for a function that the growth of modern business has shown to exist.

When businesses were small and controlled by a dominant and energetic proprietor, the latter needed only to use his own five senses to know all that was required for the successful conduct of his enterprise. Probably the capital he put into the business was his own. He determined the nature of the business himself, selected the site, bought his own materials for manufacture or goods for sale, personally interviewed, selected and controlled his own staff (who were more often than not regarded as his personal servants), supervised the technical and detail administration of the business himself, knew all his customers personally, kept his own books and in general had all the strings of the business in his own hands.

With the rise of Joint Stock Companies and the growth of huge corporations the personal element has been largely submerged. The shareholders may be scattered over the world, the business itself and its customers may embrace any geographical area without limitations. The growth of railways, steamship lines, telegraph, telephones, newspapers and other means of quick transport and communication have destroyed all limitations to growth. The economies of large scale production have made it possible by machinery to turn out goods in enormous quantities at continually lessening costs, with the result that well conducted large scale enterprise has a tendency to grow ever larger. Mere size, however, does not necessarily mean efficiency, and every large business has risks to face, which do not occur to the smaller concern, not the least of which is that the management may get out of touch through lack of knowledge.

A small man may make a mistake in production, but quickly finds out, whereas the mistake in the case of the larger concern may be covered up for some time without the fact being discovered.

A Board of Directors frequently makes far-reaching decisions on information based mainly on the opinions and even prejudices of the executive head. Even to-day the idea of Business Napoleons, whose judgment or acumen is infallible,

exists, not merely in the imagination of popular novelists and journalists, but dominates many people in the commercial world. Though the day of autocratic domination in conduct of executive detail may be toned down by more enlightened opinions and fear of trade unions, yet in the realm of policy and far-reaching decisions much too much weight is given to the intuitions of those in authority.

When presented with a given set of facts a number of business men of sound training and experience will usually come to similar decisions. Most of the differences of opinion that arise at Board Meetings are due to the absence of facts or at any rate of sufficient completeness of facts.

The only remedy for the big business is to get back relatively to the position of the small proprietor in regard to knowledge of his business. It must be enabled to know basic facts, facts about its capital, its premises, its staff, its internal working, its customers, its own potentialities, its own tendencies and the general tendencies affecting its future.

The function of Business Research is to provide an "Intelligence Department" as a substitute for personal acquaintance with facts, and owing to the mass of detail that must needs come within the scope of the research department a special technique is called for.

The idea of such searching for facts is not entirely new, either in the business or political world. For example, the Census of Population is a very old idea; even such an apparently simple task as that of counting heads calls for the use of all the theory and practice of statistical science if a qualitative as well as a quantitative analysis is required. The Census now gives us not only the population, but the distribution by areas, ages, occupations, incomes and so on.

Many of the facts required by business are obtainable from outside sources. The fact that an individual possesses a telephone, a motor car, or a house has an obvious significance to advertisers and sales managers of certain classes of goods.

Directories, lists of members of associations, names of subscribers to journals, etc., come into the same category of outside information ready-made and available to everyone.

Then there are sources of information that can be tapped by payment of fees, such as credit agencies, proprietary mailing lists, Reuter's service, private research and investigation agencies and confidential reports of all kinds.

The existence of such useful information does not mean that the management of businesses is necessarily aware of it. It might even be said that despite the constant demand on the Government, on the Press and on various institutions for more facts the difficulty for the business man is to find the required information amongst the mass of statistical and other data available.

It therefore appears inevitable that the management of large business must employ an individual, create a department or employ an outside agent specially to do the work, both to examine and report on existing data and also to obtain and classify data specifically relating to the business and not obtainable from any existing source.

It will be understood that Business Research is something apart from technical research in the engineering, mining, metallurgical, chemical or physical senses. Its purpose is to provide facts upon which to plan the action of the business itself, so that decisions are taken not on opinions, even though they are spoken of as judgments, or as the Americans would say "hunches," but on relatively exact knowledge.

The tools of the Business Research man will be as varied as business itself, but inevitably he will tend to express his conclusions in terms of statistics and accountancy. His method must be that of all research, viz., *Analysis, Synthesis* and *Deduction.* It should perhaps not be necessary to say that since his object is the intensely practical one of aiding management, both in the formation of broad policies and also in the routine daily conduct of the business, he cannot afford, nor has he the time, to seek facts for the sake of facts. In this he may differ from the academic scientist but he must at least share with all scientists the desire to give disinterested facts, uncoloured and without bias, however unpalatable they may be.

There does not appear to be any business problem that cannot be unravelled by these methods. It is impossible to cover the field in this short paper, and the following aspects of business are meant merely to illustrate the application of Business Research.

Market Research.

The one-man business proprietor knew his customer. We are apt to speak in comprehensive terms of the "market" and the "demand" for commodities. In the ultimate analysis the market consists of individuals and the demand is the total of personal preferences and prejudices. The effectiveness of demand is a question of ability and willingness to give money in exchange for an article rather than retain the money or spend it on something else. The Advertising Manager or Agent must understand Consumer Psychology and support theory by "sampling" the market. Many a new product would never have been placed on the market at all if a research had been made beforehand. An investigation will often show how a product can be improved, indicate new uses and determine the true selling points for the advertising appeal. The questionnaire is a favourite device whereby public opinion, which is the ultimate tribunal, can be sounded.

Enormous sums of money are expended by large businesses in these days to bring products to the notice of the public and create the demand that will keep the factory running profitably. Success in marketing may depend on fixing the price or the

quality correctly, packing or wrapping the article in a certain way, explaining its uses properly or using the best selling point in the advertising appeal. Though all these points may be attended to, there may be other resistances to the ready sale such as indifference, ignorance, prejudice, or unsatisfactory treatment of dealers and wholesalers. The field of marketing alone offers enormous scope for Research. It is a fundamental decision for the manufacturer to decide whether to go direct to the final consumer, direct to the retailer, or via the channel of the wholesaler and retailer. The growth of co-operative marketing of such commodities as agricultural produce would be advanced if the conditions of proper grading, easier handling, fixed pricing, even distribution and so on were determined. The success of several enterprises of this kind, notably in the U.S.A., can be dated from the initiation of a scientific market survey. A small or large business has equally the alternatives of providing the consumer with what he knows he wants, or persuading the customer to want what is offered. The only difference is that the small business knows the customer and can get his opinion at first hand.

Staff Management.

In concerns where thousands of people are employed the old personal touch and the human interest inevitably disappear. The subordinate executive and even the Managing Director are as much the servants of the Company as the lowest individual employee. Much of the unrest of the times can be traced to psychological rather than economic causes. Workers are inclined to regard business as soulless. The loyalty given readily to a personal employer is not so easy to give to a Company whose interests are represented by a Board of Directors who are seldom seen. We hear much of Welfare Work and Philanthropic schemes but the fact remains that labour problems must be settled by a careful study of the workers' own point of view, not that of the employer however kindly or well meant. Big businesses must find a way with staff, just as much as with customers, of substituting something in the place of the personal touch which the small business man could supply. Loyalties are personal ties and until there is an industrial generalship which can inspire the workers of all grades with enthusiasm and affection for their firm apart from the money earned, there will be no creative co-operation. Abstract psychological theory is no substitute for Research work. That way leads to paternalism and patronising. What the worker really wants is to be understood as a sensitive human being with hopes and aspirations, weaknesses and home difficulties and not as labour to be bought as a commodity. He is entitled to be happy in his job, appreciated for his skill and encouraged by opportunities offered and merit rewarded. Above all he desires justice and fair treatment, absence of petty tyrannising and a chance to be proud of his association with the firm that employs him. To quote an American authority on

the subject: "The most economical and wise expenditure possible under the circumstances is to make inquiries, study the experiments of others, compare, investigate, and make sound deductions applicable to the case in hand. This is the research method and the only method which can give any results until an organised body of accepted knowledge is finally developed."

Financial and Accounting Research.

Under this heading may conveniently be grouped many aspects of business that have long been the subjects of investigation and many that would profitably yield to research methods. Cost accounting and works management are excluded as coming under a better heading of Production Research.

Most businesses are familiar with some form of Credit investigation since the collection of accounts is a primary necessity for financial solvency. Independent sources of information are also available in organisations such as Stubbs'.

Much information concerning customers is buried in the ledgers, and modern Sales Promotion Departments tend to look to this source for assistance in building up and maintaining goodwill.

Statistics relating to Inventories, nature of Stocks, balance between various sections and commodities, comparisons of sales, numbers of transactions, averages of all kinds are familiar to most business men.

A modern counting-house usually includes a dissection or statistical department which provides controlling figures relating to the current operation of the concern. Moreover, the tendency of the modern accountant is to regard himself as a business doctor whose duty it is to keep his client in good health rather than as surgeon called upon to conduct a drastic operation or possibly a post-mortem.

A system of scientific budgeting, rationing of expense, fixing quotas of sales, appropriations and operation ratios, predetermination of rates of gross profit, rates of turnover of stocks and other mathematical conceptions enable the management to get a bird's-eye view of the operation of the business, to watch tendencies and judge the success of policies, plans and individuals. Increasing departmentalisation and dissection of results is apparent so that every section of any concern can be put to the acid test of whether it pays its way. Labour-saving devices and office systems have increased enormously in recent years as a result of research in this field and this development has rendered further researches in all directions more easy.

Production Management.

Much of the credit for scientific management in factories is due to American workers, notably Taylor. Time and Motion studies, investigations of conditions of lighting, heating, conveni-

ence and welfare of the workers have produced results and economies that in some cases are little short of marvellous. In the U.S.A. the developments in factory planning, routing of the product during processes of manufacture and assembly together with labour-saving devices of every kind have developed into an organised body of knowledge, the subject of many books and associations. Nor can it be said that England and Germany have entirely neglected to follow the lead.

Cost accounting too has developed into a separate branch of accountancy recognised as such by the profession. Its technique is different from that of commercial accountancy and undoubtedly includes much research and investigation in its scope apart from its obvious routine function.

Research by Industries.

It is being more and more realised by the more enlightened business community that the individual business is deeply concerned with everything affecting the industry of which it forms part. The tendency for industrial associations, therefore, must be to maintain co-operatively a Bureau for the ascertaining of facts concerning the industry as a whole for the use of individuals and as a basis for collective action if necessary. Some of these associations have long maintained Technical Research Laboratories, but the necessity for Business Research in the sense of this paper has not been so apparent. One of the greatest difficulties appears to be that firms in this country are greatly averse to giving information concerning their own affairs even to their own trade association, because they fear that rival firms may get hold of these facts. The difficulties of the recent Census of Production will indicate how averse firms are to giving away the supposed secrets of their affairs even to Government officials who are sworn to treat them confidentially. It does appear that an educational effort is needed in this respect. Recent observers from this country in U.S.A. appear to be struck by the fact that the free exchange of ideas is an accepted maxim and business men in that country readily accept the view that they have nothing whatever to hide about the way they do their business.

Conditions for Successful Business Research.

The main conditions for successful business research are firstly a recognition of the need, secondly the discovery or training of men and women with research minds and thirdly the growth of confidence on the part of business men, which will cause them more and more to base their operations on the results of research.

For each of these conditions to be fulfilled it is obvious that educational effort is required.

It is still difficult to convince business men that scientific methods, apart from technical industrial research, have any application to the practical conduct of affairs. For this state of

things it may be that academic treatment of economic science is responsible. Few business men are able to find any direct benefit in the daily conduct of their affairs from theoretical study of political and social economics as taught in our colleges and universities. Even to-day we find ample evidence of a snobbishness that looks down on men engaged in trade. One may also offer the criticism that abstract economics seems at present more concerned with debating about socialistic ideas and attempting to justify or criticise the existing "capitalist" system, than with the study of practical economic facts. Whatever opinions we may hold as individuals as to the fair distribution of the wealth that business alone creates, we can at least agree that under any social system it is of paramount importance that wealth should be created and the best methods adopted to avoid waste effort and increase the effectiveness of all the factors engaged in its production.

Until quite recent times it was laid down in the standard textbooks that wealth was created by the three factors—Land, Labour and Capital. It is true that to-day the fourth factor—Management—has been recognised, but the admission seems to be a grudging one.

Enlightened business men know full well that prosperity in all enterprise results from good management more than from any other factor. Autocratic and ignorant management is wasteful of capital, natural opportunities and human endeavours. It is no longer necessary to believe that one country or one individual can only be prosperous and happy at the expense of another's poverty. A business to-day can only exist by rendering a service that the community appreciates and is willing to pay for. If the management is sound it will find a way of offering its services at a price the community can afford and at the same time will succeed in paying wages and providing conditions of employment that will make happy and prosperous workers whilst giving safe and adequate return to those who entrust their savings to its care. Thus a well conducted business is an all-round benefit to the community and the state.

If this be the function of business management then one can only express the hope that business in this country may be conducted and managed by men who have such practical ideals and who are ready to adopt the best tools for their aid. The future will undoubtedly demonstrate that not the least of these is Business Research.

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Major L. URWICK, O.B.E., M.C., M.A. (Messrs. Williams and Norgate, Ltd.), said he would like to express his hearty appreciation of the scope and range of Mr. Cooke's paper. The first point laid down was a recognition of the need for applying modern scientific methods in business. This was growing, but recognition of the need was only the first step in the process. The second was the discovery and training, in industrial problems and conditions, of men and women with research minds. A third necessity was growth of confidence on the part of business men, who were often averse to putting their confidence in men with a scientific outlook. The main difficulty was to integrate the research

mind with the business mind. He felt that experience tended to suggest that the introduction of men with research minds advisory to others with business minds who were already in charge of industrial concerns was not likely to solve the problem. This procedure was the plan usually adopted at first and appeared a reasonable approach to the difficulty; but the business men, however enthusiastic in the beginning, developed resentment when they discovered that the investigations of the scientist involved apparent criticism of the methods they were using, particularly when the scientist was a subordinate and a junior. The only final solution was to train men with scientific attainments for the highest executive positions. In introducing scientific methods the approach to the workers had to be very gradual and, above all, educative. Loyalty was essential—not only the loyalty of the employed to the employer, but of the employer to scientific principle and to the colleagues working with him. Employers might find some useful suggestions for the building of group loyalty from a study of army methods. When the regimental spirit on which the esprit de corps of the Army was founded necessarily broke down owing to the expansion during the War, a new loyalty—loyalty to the Division—was substituted almost overnight, and as it was unconsciously, by the leaders of the Army.

Mr. A. W. BURTON (Department of Overseas Trade) called attention to one aspect of market research not hitherto mentioned, namely that of export market research. Investigations into conditions governing trade in various countries should not be the business of the Sales Department but of the Research Department.

There was not enough of this research amongst individual firms, though useful work was done in this direction by the Federation of British Industries. He said that the real reason for his joining in the discussion, however, was to call attention to the help that the Department of Overseas Trade could render in research work. It had ample material at hand for answering almost any question affecting export trade.

It was significant that it was only since the war that the U.S.A. had taken up seriously the question of research into export trade and their Government Department dealing with foreign trade was modelled to a considerable extent on the organization of the Department of Overseas Trade.

Mr. L. E. BIRD (International Research Bureau) remarked that some very interesting speeches had been heard on the psychological difficulties facing the application of research amongst the British worker on the production side of business.

The same difficulties existed in Market Research. In recent investigations he had made he had found the retailers very suspicious of research workers. When approached they immediately thought "What is the manufacturer trying to get out of me now?" The solution of all these matters might fail to elicit satisfactory reports where another would gain valuable information. What was needed was more qualified research workers; it would be a great assistance if this Association could ascertain the essential qualifications required for the training of experienced market investigators.

Mr. LEONARD HILL (Messrs. Leonard Hill, etc.) pointed out the difficulties of persuading manufacturers of technical products (i.e. those not selling to the general public), to use a specialist advertising and selling service. Regarding export trade, many Canadian correspondents had found a catalogue of British Chemical and Engineering plant useful, and had referred to the desirability of the British manufacturers who were catalogued carrying stocks in Canada, or appointing a direct agent, or in some other manner establishing personal contact.

Mr. S. J. Nightingale (Metropolitan-Vickers Electrical Co. Ltd.), Dr. R. S. Hutton (British Non-Ferrous Metals Research Association, Birmingham), and Mr. W. S. Jarratt (H.M. Patent Office) also spoke.

VISIT TO BODLEIAN LIBRARY.

The Saturday afternoon was left free. Many members of the Conference availed themselves of the kind invitation of Dr. A. E. Cowley, the Librarian, to visit the Bodleian Library; in addition to being shown round the Library proper, the visitors had the privilege of seeing the immense underground book stack.

INFORMAL DISCUSSION.
"THE DISSEMINATION OF INFORMATION."

An informal discussion, led by Miss M. K. E. Allen, B.Com.Sc. (Linen Industry Research Association, Lambeg, Co. Antrim), was held on Saturday afternoon (September 25th, 1926), when the subject of distribution of information by means of a loose-leaf system was brought forward. It was suggested that Research Associations and other bodies could issue information to their members on loose-leaf data sheets and the information contained on these be supplemented by data sheets on general subjects of interest prepared and issued by a central organization.

The Linen Industry Research Association was considering a scheme for the use of its members, and suggested that if the various Research Associations, manufacturers and other bodies considered taking similar action the same size of loose-leaf sheets should be adopted. The size proposed was 6 by 3½ inches with ½ inch margin on each side, since loose-leaf pocket-book makers stated that this was their most popular size. Such a sheet, which would be on thin paper, could be filed away in a standard card index by enclosure in a suitable envelope. It was suggested that the use of minion type was preferable for the purpose.

The general scheme was approved, but it was agreed that the matter of size should be discussed further.

It was suggested that A.S.L.I.B. might bring before Sir Arthur Balfour's Committee the question of the standardization of data sheets.

SECTION 1 - - - Saturday evening, September 25, 1926.

Chairman:
Mr. W. BARBOUR, M.A., B.Sc.

SYSTEMS OF CLASSIFICATION, WITH PARTICULAR REFERENCE TO THOSE USED IN SPECIAL LIBRARIES

By W. C. Berwick Sayers, F.L.A. (Chief Librarian, Croydon Public Libraries).

Although I have devoted what some of my colleagues believe to be a quite disproportionate part of my life to the study of classification, I make no claim to be a special librarian or pretence to a knowledge of the intricacies of any of the exceedingly individualistic subjects with which most of you are concerned. When, therefore, I accepted the kind invitation of the Council to open a discussion I was comforted by the somewhat spacious character of the title they had chosen—for my title was their choice—considering that they wanted only a general view of classification and not a discussion of that impossibility, a scheme of classification for special libraries.

Although we stress very naturally the special character of our separate duties, it is safe on the whole to say that the business of all librarians is very much the same. The utterances of the complimentary public men who tell us we are the guides and directors of the intellectual lives of the community, can be reduced prosaically to a sound definition of ourselves as people whose business it is to save the time of others by bringing before them comprehensively, accurately and rapidly any material they may need upon the subjects in which they are interested.

It seems to me there is no better definition of the work of a librarian in general than this, and it applies equally to the general public librarian and to the special librarian. If, then, he is to bring the material or information and the inquirer together at the right time, he must possess an equipment which it would not be beneath the dignity of any scholar to possess. Part of that equipment, and it seems to me the very basis of it, is such a knowledge of the parts of the subject with which he has to deal that he is able to see them in all their relationships; that he is able to visualise his subject, in short, as a well-mapped territory in which all the arterial- and by-roads are clearly recorded. Such a knowledge demands classification, is indeed a result of the classifying process. Therefore, the basis of all library work, general or special, is a knowledge of classification.

I would suggest to you, however, that no librarian can know his own subject adequately if his knowledge of classification is limited to his own particular field of science, industry or intellectual endeavour. I imagine that there are very few subjects which are so self-contained that one dares to say of them that they have no inter-relations with other subjects, or are not influenced

by them. In fact, such a subject would be either unique or a logical absurdity. Is it too much then to expect that the special librarian should have more than a nodding acquaintance with the main schemes of classification which have been proposed for the arranging of knowledge as a whole?

I have noticed that, when a student first begins to make a study of classification, by some impulsion he nearly always begins also to construct a classification scheme of his own. It is an admirable intellectual practice, but that only, I think. Every special librarian I have known has been perfectly convinced that no existing classification will serve the purposes of his business; he must make a new one which does. It would appear, therefore, that there are as many special classification schemes as there are special libraries. I am not prepared to say in any dogmatic way that this should not be so. A librarian would be justified in going to the very great, and sometimes unprofitable, labour of constructing a new scheme if his decision to do so were based upon a comprehensive knowledge of the schemes which already exist. It will be gathered that I am pleading for some effort towards a co-operative, comprehensive classification, catholic enough and sufficiently hospitable for the use of most collections of material. There is no question whatever that there is a great waste of efficiency if in four separate libraries on (say) chemistry there are four separate methods of arrangement. Presuming they have distinctive classifications, their catalogues and methods of use will also be distinctive. An inquirer going from one to the other must go through the labour of learning the new arrangement each time. Nor can the librarians themselves exchange views on the disposition of difficult material unless there is some agreement as to the general arrangement.

A classification to be satisfactory must answer the following conditions:—

(1) It must be comprehensive, and its terminology must be adequate.

(2) It must be equipped with a notation which is flexible and will permit the re-division of any part of the classification to any extent, or the insertion of a new subject at any point.

(3) It must be as simple as is consistent with the foregoing qualities.

There are many other things desirable in a good classification, but these are its chief requirements and virtues. Do the classifications that exist in any way approximate to them?

I think the answer is in the affirmative. The most flexible instruments for marking material, whether it be books or files of cuttings arranged on any such system as the loose leaf or individual vertical filing systems, are the decimal and alphabetic arrangements. Of these the most remarkable is the decimal arrangement, and that combined with alphabetical subdivisions such as were advocated by Mr. Jast at the Conference last year.* There are four classifications, all general in character, which belong to these arrangements, and deserve the careful study of anyone who is taking up special library work. These are

The Decimal Classification of Melvil Dewey.

The Expansive Classification of Charles Ammi Cutter.

* Association of Special Libraries and Information Bureaux. *Report of the Proceedings of the Second Conference*, p. 95, 1926.

The Subject Classification of James Duff Brown.
The Library of Congress Classification.

All these are classifications intended for the arrangement of every type of material that would come into a great general library. The word " general " does not mean that there is no specialisation in the classifications, because it must be clear to everyone that a library containing millions of volumes like the Library of Congress must simply consist of a very large number of special collections, very minute in detail. This detail is represented in the Library of Congress Classification.

Of the four classifications named, that which has the most universal appeal, as your own Proceedings give ample evidence is the *Decimal Classification* of Dewey. It has the remarkable advantages of being simple, logical and infinitely expansible. In some of its categories it is undoubtedly not quite abreast of modern knowledge. That, however, does not in the least matter—at any rate it is not vital—because its revisableness (if I may coin the term) is so great that it can be adjusted to suit all places and circumstances. It appears to me that those who say that the Dewey Classification cannot be used for this or that type of work say so because they really do not understand the nature of the classification.

I merely mentioned the Brown *Subject Classification* because it is a unique example of a one-man classification of universal knowledge. It is a wonderful achievement in logical arrangement, convenient terminology and mathematical sub-division. The introduction to the work, moreover, is full of sound common sense for all classifiers. I would not recommend any special librarian, however, to use it as the basis of his own work.

The choice appears to me to lie between the *Decimal Classification* of Dewey, and the *Library of Congress Classification*, which is a largely revised and much expanded version of the *Expansive Classification* of Cutter. In its comprehensiveness, modernity and scholarship the Library of Congress Classification stands alone but on its mechanical side—its notation, methods of sub-division, common sub-divisions, special tables, etc., it is the most clumsy scheme that exists.

All things considered, it appears to me that the Dewey Classification forms the best basis for special work. What is required is an exhaustive expansion of each class in the scheme in order that it may meet the needs of the special librarian.

To a large extent much of what I have been saying has been anticipated, I find,at your last Conference. It was especially interesting to see included in your Proceedings the paper on *Efficient Filing*, by Mr. R. Borlase Matthews, which certainly affords many important considerations for the special librarian; but the most valuable part of that paper, in my view, was the part which dealt with the Brussels Expansion of the Decimal Classification. Even more fortunate are we to find a paper by Professor A. F. C. Pollard describing the *Decimal Classification of the Institut International de Bibliographie*, which is the best contribution in English that has yet been made to the study of the greatest piece of bibliographical mechanism that exists. This debt of librarians to Professor Pollard has been greatly increased by

the issue of a translation of such part of the *Classification Décimale* as refers to Optics and allied subjects. By means of this, for the first time English students are able to see an almost perfect method of classifying the most minute material.

It may be objected that the use of a general classification for special work means that only a bit of the scheme is employed; that the minute sub-division required will mean a forbiddingly long notation, and so on. Both arguments are true, but the length of a notation should always be judged in the relation to its effectiveness. To object to a sign that consists of five or six symbols—letters or figures—is unworthy of present-day librarianship. Minute classification must always have a fairly long notation.

If, therefore, we could induce special librarians to focus their attention upon one of these great classifications, the result would be incalculable. All material in every subject could be marshalled so that it formed a vast encyclopædia of knowledge. Each speciality would be worked out by its followers to the fullest extent it warranted or permitted, and uniformity of opinion and of method would be attained in connexion with any new subject or the development of any old one. Bibliographies, catalogues, reading lists, and other reference information would always be presented in one easily-comprehended manner, and much energy which is now devoted to making schemes of arrangement would be liberated for the better exploiting of the material arranged.

It will appear to you that I have been advocating the adoption of a single standardized scheme of classification for all library and all information bureau purposes. It may be an impossible ideal or in the eyes of some it may not be an ideal at all. There are those who still argue that a standard scheme of classification which can be applied to all ramifications of human thought and activity is absurdly impossible. I think the answer is that as the work of one man it would be absurdly so, but as the work of the whole bibliographical intellect of the world it would be quite a possibility.

On the other hand, there are those who argue that a standardized scheme is not an ideal to be encouraged. Apart from other considerations it would tend to destroy the individual initiative of librarians. This sort of argument does not make very great appeal to me. Classification is a most valuable aid in our work, is, as I have said, the basis of it, but we do not wish to spend the whole or many years of our life in laying down the basis of our life work. Libraries do not exist to foster the individual initiative of librarians. What we need to do is to agree upon some general method of working in this direction, and then to see that specialised treatment is given to the scheme of classification which receives the majority of our suffrages.

I am too painfully aware that this paper is unworthy of the Conference, but in the midst of many pressing duties I have thrown together these few simple notes in the hope that their kindergarten character will at least be provocative.

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Mr. B. M. HEADICAR, F.R.S.A., (London School of Economics and Political Science) agreed with much, in fact, most, of what Mr. Sayers had said, but strongly disagreed with his opinion that the Dewey classification was undoubtedly the best for a Special Library. After many years'

practical experience and study of the chief printed classification schemes he decided to adopt the Library of Congress classification for the Library of the London School of Economics, which was now being re-classified and re-catalogued. Class 3 was probably the weakest in the Dewey classification, and was the one in which the greater part of the School's Library would be located. The Congress scheme for the Social Sciences was admirably complete and supplementary tables were frequently issued. In addition, the Congress List of alphabetical subject-headings gave in each instance the classification mark and this was a great help in determination. Mr. Headicar agreed that Dewey could be made to meet the requirements of any special library but so could the Congress scheme, and with very much less trouble. He was often told by specialist librarians that they were using a scheme of their own, because Dewey, Congress, etc., were not suitable, which usually meant that the librarian in question did not understand either and did not want to learn them.

Mr. P. K. TURNER, A.M.I.E.E., M.I.R.E., (Burndept Wireless Ltd.) said that in the course of the remarks with which Mr. Sayers introduced his paper, he had poked a little gentle fun at an earlier meeting of the Session, during the discussion of which, Mr. Sayers had said, there appeared to be considerable confusion between Classification and Indexing. As it happened he himself had taken some part in that discussion, and he felt called upon to explain how this arose. It was true that the author of that other paper used the word "indexing" in his title, but in the paper itself he drew certain comparisons between his system and the Dewey System which made it clear that he was really discussing the merits of an alphabetical classification as compared with those which one was accustomed to call logical classifications. It was this last subject on which he himself had spoken.

He wished to congratulate Mr. Sayers on the clearness with which he had brought out one essential point in the choice of working systems for special libraries: the fact that no special library or research department, however specialized its subject, could afford to ignore the existence of the others. It was a truism that practically any system of classification and indexing would be satisfactory if it was handled by the right kind of staff; but if the system was one invented for the individual needs of the institution in question, totally unnecessary difficulties arose whenever there was any question of co-operation between that institution and another. On that ground alone it seemed to him essential to adopt one or other of the well-known classifications.

This, however, naturally led to the consideration, that for any highly specialized work, the great classifications did not go into sufficient detail, and it therefore became necessary to use a specialized extension of them. It thus happened occasionally that different institutions covering cognate subjects might elaborate independent extensions without being aware of the fact. It would obviously be advantageous if one could set up some sort of clearing-house for such extensions, nearer to hand than the Dewey Headquarters. Mr. Turner believed that there were several members of the Library Association present, and wished to suggest to them that the Library Association should appoint a small standing committee whose duties should be to keep a record of all such extensions, and as far as could be done practically, to give advice and assistance in making new ones. In view of the fact that the majority of such extensions were based on either the Dewey System or the Brussels extension, the committee might, at any rate as a commencement, confine itself to this system.

Mr. EDWARD A. MARTIN, F.G.S. (Croydon Public Libraries Committee) hoped that the example of certain German Libraries which, as stated by Mr. Headicar, had given up all classification, would never be followed by our Public Libraries. Students would stand aghast at having to look over a whole library in order to find any particular book, and Library Committees when considering the purchase of new books would be in the difficult position of not knowing what books they already possessed.

Mr. L. Stanley Jast (Manchester Public Libraries, etc.), Lt.-Colonel L. Newcombe (Library Association, etc.), and Mr. M. C. Butler, L.R.A.M. (British Esperanto Association (Incorporated)), also spoke.

SECTION 2 - - - Saturday evening, September 25, 1926.

Chairman:

Mr. C. R. SANDERSON.

THE TRANSFORMATION OF FILES OF DATA INTO AN ACTIVE SERVICE.

By S. S. PICKLES, D.Sc., F.I.C.

(Chairman: Library and Information Bureau Committee, Research Association of British Rubber and Tyre Manufacturers).

In the presence of so many librarians and others whose normal daily functions demand expert knowledge of the filing, indexing and cataloguing of all kinds of published information, it is perhaps as well to explain at the outset that the following remarks from a non-librarian are not intended to be taken as indicating precisely how files of data should be transformed into an active service. My object is to give a brief account of the efforts which are being made by a particular institution—the Research Association of British Rubber and Tyre Manufacturers—to supply its members and clients with information of a special character concerning their own and allied industries.

The Library and Information Bureau forms one of the most valued units of the Research Association's equipment and some account of its methods and of its work generally may be of interest to those who are engaged in similar undertakings.

The manufacture of rubber is extensive and intricate and like many of our older industries has had to pass through stages of empiricism and secrecy. In recent years however its fundamental principles and the development of its various processes have formed the subject of many scientific and technical investigations; it is the collecting, summarising and distribution of this ever-increasing volume of resultant literature which forms the principal object of the library and information bureau.

In the rubber industry many sciences are involved, for whereas in the cultivation of the rubber tree the botanists and mycologists are perhaps of greatest importance, the subsequent stages of manufacture demand the specialised knowledge of the chemist, the physicist and the engineer. In addition, the business side calls for expert statisticians, accountants and industrial economists.

Needless to say many countries beside our own are interested in this great industry and for the abstracting of the necessary information acquaintance with the principal foreign

languages is a necessity. It is a fortunate coincidence therefore that the members of the staff of the Research Association are available for this work. Having had the necessary University or Technical College training they are qualified and equipped to deal with the scientific and technical literature of a subject of which they are making a special study.

In the very interesting and instructive address given by Mr. Sanderson at last year's conference, the functions of an efficient special library were stated to be :—

(1) To collect from various sources all the available material;

(2) To arrange, catalogue and index that material so as to make it easily accessible; and

(3) To elaborate and present information in a form in which it can readily be absorbed and utilised by clients.

I think no better epitome than that can be given of the objects which we have in view.

With regard to the service which the Library and Information Bureau is striving to render, the information to be supplied may be considered from two aspects, viz.: (1) current knowledge consisting of the subject matter contained in current scientific and technical publications, trade journals, newspapers and periodicals, and (2) older data concerning specialised subjects of industrial importance.

This arbitrary classification has formed the basis of the scheme which has been adopted for the distribution of information to members of the industry. This consists mainly in the periodical publication of (1) A Summary of Current Literature, and (2) Information Bureau Reports on special subjects.

Summary of Current Literature.

In connection with the library a Summary of Current Literature is compiled and published each month in which references (and in many cases abstracts) are given of all matters of interest which have occurred during the preceding month.

Some idea of the ground covered can be gained by a glance at the titles of the various sections into which the Summary is divided. These are as follows :—

(1) Crude Rubber and Allied Substances, including :—
  (a) Planting.
  (b) Latex.
  (c) Raw Rubber.
  (d) Gutta-percha, Balata, etc.

(2) Fillers, Pigments and Substitutes.

(3) Fibres and Textiles.

(4) Accelerators and Vulcanisation.

(5) Vulcanised Rubber:
  (a) Properties.
  (b) Analysis and Testing.
  (c) Technical applications:
    Pneumatic Tyres, Inner Tubes, Solid Tyres and Tyre Patents.
    Paving and Flooring.
    Boots and Shoes.
    Rubber-proofed goods.
    Surgicals.
    Mechanicals.
    Hose, Belting, Tubing, Fancy Goods, Cables.
    Hard rubber or Ebonite.
(6) Machinery and Works Technique.
(7) Chemistry, Physics and Colloid Chemistry.
(8) Miscellaneous.
(9) Patents.
(10) New Publications.

A brief description of the process of compilation of the Summary may be of interest.

The Special Library of the Research Association of Rubber and Tyre Manufacturers at Croydon consists of approximately 1150 volumes of British and foreign books and periodicals, of which about 20 per cent. are German, 10 per cent. French and 6 per cent. Dutch. In addition there is a collection of 1500 pamphlets of various kinds including patent and general specifications, reprints, etc., dealing with the rubber and allied industries.

Most of this literature has been abstracted and a very efficient card-indexing system is in operation. The number of subject cards has already reached a total of 14,000 and it is interesting to note as an indication of the rate at which new information is becoming available that during the four years 1923-26 the number of subject cards added has been 2000, 3000, 4000 and 5000 respectively. The number of different journals regularly abstracted amounts to 48.

On receipt of the journals a label is attached to each with the name of the abstractor and the dates of issue and return. These must be returned within one week to the librarian who classifies them and inserts the heading. They are retained until the end of the month when those suitable for publication in the Summary are selected. After the issue of the Summary the cards are cross-indexed under author and subject and inserted in a card case.

The system of classification adopted for books, card-index of subject cards and abstracts in the Summary is a provisional one which has grown up somewhat unsystematically with the collection. In general it follows the hierarchy principle. It is intended however to adopt for the collection a form of the decimal system as modified by the Institut International de Bibliographie.

The published Summary is designed to form a card-index in itself, the pages being printed on one side only so that the items can be cut out, pasted on cards and classified according to the scheme in operation in individual works. The books and periodicals to which the various abstracts refer are available for reference or on loan to members of the Association and subscribers. The Summary issued during 1924 contained 318 printed pages; that for 1925 had increased to 437 pages. The corresponding number of abstracts was in 1924 1860 and in 1925 3600.

Needless to say the abstracting and presenting of the gist of the numerous articles, etc., requires much labour, considerable skill and a special acquaintance with rubber manufacture. A thorough grasp of the trend of modern research work is essential and the work can therefore only be satisfactorily conducted by trained men. On the other hand however this work is of considerable educational value to the research staff and keeps them in close touch with current work in other fields.

The advantages offered by the Summary to those engaged in the industry are many; amongst them are the reduction in the number of journals which they need to purchase, the saving of time and the more comprehensive view which they obtain of the progress which is taking place in any particular direction.

Information Bureau Reports on Special Subjects.

The second aspect of the transformation of files of data into an active service is that which results from the receipt of inquiries relating to special subjects. This is a department of the library's work which is developing very rapidly as the result to a large extent of the publicity and the spirit of inquiry which has been aroused by the publication of the Summary of Current Literature.

Nearly one hundred inquiries for special information have been received during the past six months from members, subscribers, trade journals, other Research Associations, the general public, patent agents, Government departments and firms connected with other industries. Very often come requests for further and fuller information on certain subjects and many useful monographs surveying literature on subjects of special interest have already been prepared. In the preparation of monographs the files are of incalculable value. These connected accounts are supplemented and kept up to date so that a complete and efficient information bureau which should be of the greatest value to the industry is gradually being built up.

One of the greatest problems with which we are faced at the moment is the inclusion of references to the older literature. The filing of current work is now more or less automatic but the abstraction of references from back literature (for the past 60 years or thereabouts) although of the utmost importance is a matter of some difficulty.

Many different types of inquiries are received in addition to those of a specialised scientific and technical character connected with the industry: requests for the names of manufacturers of certain kinds of goods or machinery, particulars of new inventions, advice regarding the use of rubber for special purposes and information regarding trade statistics.

A file of a somewhat unusual character consists of a series of lantern slides illustrating the history, processes and machinery of the rubber industry. A very interesting collection is gradually accumulating and the slides are available on loan.

The preparation of statistical information is also being undertaken and it is hoped that in the near future the library will be able to publish fortnightly a Summary of Commercial Intelligence on similar lines to the Summary of Current Literature. In this will be embodied statistics relating to the home industry in regard to such subjects as employment, unemployment, accidents, prices of raw materials, contracts open and placed, Company reports, etc. Reports of British imports and exports showing values, quantities, origin and destination will also be included and should serve a useful purpose and be of value for reference purposes.

Similar figures will also be given relating to the principal manufacturing and consuming countries abroad, together with information regarding tariffs in foreign countries, facilities for transport, railway and road conditions and opportunities for the development of foreign trade.

INFORMATION BUREAUX AND THE COMPILATION OF DATA FOR FORECASTING.

By R. BORLASE MATTHEWS,
Wh.Ex., A.M.Inst.C.E., M.I.E.E., F.R.Aë.S.

While it is very difficult to lay down a clear line of demarcation between a " Special Library " and an " Information Bureau," their functions definitely differ. In fact the " Special Library " is really but one of the most important tools of the " Information Bureau." The existence of a really up-to-date " Special Library" enables the Information Bureau to meet most of the calls that are made upon it for data. It is however the work of the Information Bureau to collect the data for the library. It is in this search for material that such great opportunity is afforded for initiative. An Information Bureau without initiative is an anomaly.

It therefore goes without saying that an Information Bureau is not easy to run but the author, from personal experience extending from the year 1906, is perfectly certain that the trouble taken is well worth while.

In order to establish that its importance is not a matter of an isolated opinion, Doctor Charles L. Reese's recent remark is of interest. He said : " To the individual nation or race which most skilfully, thoroughly and wisely masters and uses the accumulated knowledge of mankind, comes supremacy in industry if not in science, politics and art." So much for the use of a well-run Information Bureau. It can be a connecting link between one department and another—the main spring of new ideas—and it should be a department to which everyone turns in the quest for knowledge. The true motto of an Information Bureau must ever be that " If any required information is in print or typescript we have it or can get it or a photostat of it, or we can tell you where to get it."

Nature of Information Bureau.

The primary need is that an Information Bureau should be up-to-date. Scientific writings of three months ago may be interesting, but to the Research worker or the Sales Manager who is anxious to put his wares in the forefront of all markets they are of little use. He wants his facts to be authoritative and new. When it is considered that some 24,000 scientific periodicals are published, it will be realised that it is not an easy matter to be sure of having a complete record of any one subject, particularly in view of the fact that it is all too

difficult to obtain early information, publishers' notices, etc., of scientific works while they are yet in the press. It is not suggested that any Information Bureau could possibly obtain a copy of every periodical or book published connected with the particular trade concerned. The great point is that nothing must be published without a note about it being in the hands of the man in charge of the Bureau. If chapter headings of a scientific volume can also be obtained, so much the better. Obviously even a superman would be unable, at a moment's notice, to reel off complete details of any of the thousand and one subjects which might interest the Managing Director of his firm. What he must be able to do however is to present a comprehensive list of the titles of articles, books, etc., written upon the subject, together with addresses which serve to show from whence copies of those which most appeal to the Managing Director can be obtained. He must know, further, the ins and outs of the many technical libraries and scientific institutions from which it is possible to borrow books. Nothing is so amazing as the small number of men for instance who borrow from such libraries as those attached to the Ministry of Agriculture or the Institution of Electrical Engineers.

Efficient Filing.

There are firms where, unhappily, " not lost but gone to file " appears to be the motto under which those responsible for the putting away of correspondence and subject matter, etc., work. Nothing is more disastrous from the Information Bureau point of view than for the whole labour of the collection of data to be wasted by the inefficiency of the method upon which it is filed. Prompt classification and a sufficiency of cross-referencing, both being made by one who has sensed what may be called the viewpoint of his firm, should be marked features of the filing. Old methods of filing dependent on alphabetical arrangements do not cope adequately with the work of a Bureau, as either only the general heads of the filing matter are dealt with, or else an index is so extensive and complicated that the prompt allocation of the subject is not possible. The dictionary method for instance presents no connected view of any subject, yet it is the one most often adopted, possibly from a mistaken idea of its simplicity. By the end of the seventeenth century fifty systems of classification had already been evolved, a number which has now been tripled. Of these it is usually agreed that the best is an extension of the Decimal Classification of the Institut International de Bibliographie, sometimes known as " Dewey Expanded " or the " Brussels Index." This method has recently been adopted at the headquarters of the League of Nations. The method of using decimal numbers is one of the most important features of this system. It enables the interpolation of new numbers indefinitely, which addition does not interfere with any previous classification, and the data on a subject automatically become grouped together, thus lessening the necessity for extensive searches for information. Technical papers and trade catalogues lend themselves particularly well to this system and

make it comparatively simple to decide upon the physical position of various portions of catalogues, articles, etc.

It must be realised that detailed analysis of data is essential in a library of this sort, and a decimal classification system will reduce to a minimum the amount of cross-referencing which it is necessary to do. The decimal classification system has already been dealt with by the author in a previous paper* wherein the whole system was explained fully, together with suggestions as to the mechanical method of filing. It may be remembered that ball-bearing vertical filing cabinets were only recommended for departments where a small amount of data is to be filed, it being found better to employ cardboard boxes. These boxes fold flat until required, when they make containers measuring about 10½in. by 11in. by 2½in. Their cost is about threepence each and they are a commercial standard, though not intended for office use. As the cost is low, a box can be allocated for each main subject. When the box becomes full the contents should be re-classified, thus starting a new case with a new decimal number and at the same time facilitating reference.

For purposes of illustration it might be interesting to take a practical example: in the library of the author there is a box No. 631.588.1, which is the classification number of the subject "Electro-Culture." Upon opening the box thus marked there appear three books of Transactions of an Association which has dealt extensively with the subject; copies of Ministry of Agriculture Reports on Government experiments; pamphlets relating to the Wolfryn Process; photographs and copies of the specification, with details in French and German of the Christofleau apparatus; approximately 100 press cuttings relating to the subject—Continental, Colonial and British—each mounted on a quarto sheet of white paper; copies (on coloured paper) of letters which in the capacity of consultant the author has sent to various people upon the subject; a booklet on the *Application of Electricity to Seeds* by a well-known Australian experimenter; notes on all articles which have appeared relative to the subject of which there is no copy in the box; and price lists of apparatus. Roughly that is the kind of contents which every box in an Information Bureau Library should have.

It has been mentioned above that photographs were found in box No. 631.588.1.

Photographs on the whole come expensive, and no Bureau is properly equipped unless it has a dark room with a photostat apparatus therein. By means of this copies can cheaply and quickly be made of documents, pages of books, as well as photographs; this system is already in use in Patent Offices here and on the Continent, at the Air Ministry's Aeronautical Library and in many American libraries.

Efficient Filing, a paper read before the Second Conference of the Association of Special Libraries and Information Bureaux, 1925.

Other Duties of the Information Bureau.

So far this paper has been devoted to the obvious duty of an Information Bureau, i.e., the collection of information. A little attention, however, should be given to the manner in which such information is to be imparted and used. The man actually in the Bureau is the one most likely to see opportunities for the use of the knowledge in his possession; it must therefore fall to his lot to circulate his information as well as to await inquiries. The Bureau should be the home of information—not its burial ground. The attention of the staff must be called to any important publication or announcement, otherwise it will probably be overlooked, and it is suggested that this should be done by a daily digest. It is a good idea to provide a form on a quarto (10in. by 8in.) sheet so ruled that it provides three slips 3in. by 5in. in dimensions, i.e., the size of a standard index card), as shown in the third diagram which accompanies this paper. The sheets should be printed in hectograph ink: hectograph ribbons should also be used in the typewriters employed in making them out. (In this way they can be copied on a gelatine or litho duplicating machine immediately they are out of the typewriter and thus expedite the circulation. The margin on the left can be used for inserting the name of the member of the staff for whom it is intended. The use of an addressing machine is the most suitable way of doing this; no omissions will then occur. After the circulation of these digests, it is unwise for books, periodicals, etc., to be loaned from the library, it being a safer plan to allow those who wish to use them to come to the library to do so.

Study of Home and Foreign Conditions.

The Bureau should make a scientific examination both of the home and foreign markets so as to supply the Managing Director with the information which is vital if mistakes due to assumption and half-truth are to be avoided and all guesswork eliminated.

The Economic Service.

In the United States, Economic Services have been asked to supply this information (the Babson Statistical Organisation and the Harvard Economic Service), and in this country the London and Cambridge Economic Service has done this work for the last two or three years. Periodical reviews of economic statistics are published, illustrated by charts, the Babson being one of the most interesting examples of this work. It is a graphical representation of business. It shows for the past 20 years (1) Stock, (2) Bond, and (3) Commodity Prices, inspection of which reveals the close connection between periods of "boom" and "depression," to such an extent that a situation can be anticipated in time for the avoidance of many a menace. Again, the Harvard chart is useful as a long range business forecaster. Three curves shown by it are (1) Money Rates, (2) Commodity Prices and (3) Investments. There is a logical relationship

between these three curves. A definite period elapses between their movements and their turning points, whether upward or downward, practically always appear in the same order. With this sequence of the movements a valuable guide is offered for scientific business forecasting. The investment curve moves first, Business second, and Money Rates third. Changes are indicated some months in advance. For instance, the decline of the Commodity curve is preceded from 6-9 months by a falling off of investments, while at the same time there is a rise in the Money Rates; whereas when there is a recovery in the Commodity curve it is always preceded from 6-9 months by a revival in investments and a fall in Money Rates.

It is not suggested that any economic service should be asked to supply the specific curves required. If the Head of an Information Bureau has at his disposal charts such as have been described, he will also have in his own records data which when studied in conjunction with these charts should give him a lead as to where the business of his firm stands. Once again initiative is required to suggest to him arrangements of his figures so as to give a graphical illustration not only of the state of present sales, but of what should be the policy for the next three months. Imagine for instance a large business house where, say, a graph of the sales for the past ten years was kept up-to-date; it would be found that if the sales figures were plotted against a manufacturing index figure supplied through a reliable agency, the turn in the manufacturing index had taken place at some definite time before that of the sales house. The value of such knowledge is clear to all.

Sales Records.

The percentage of sales for the month should always be worked out in the Information Bureau and compared with the sales for the corresponding period in the previous year, the turning points then being easily discernible. Estimates of prospective sales naturally indicate the required output of the works or factory and also give an idea as to the raw material that should be ordered.

The second illustration to my paper shows how by using such curves it is easy to see the earliest possible moment where a turn is beginning. In the columns of *Electro-Farming,* a journal which has been established for a little over a year, the food prices forecast is built up from information similar to that detailed above, due regard being given to seasonal variations.

Closely allied to the work described above is what may be termed market analysis, i.e., the gathering of information on sales policies, distribution difficulties, the study of the trend of the likes and dislikes of the public, local tastes and local prosperity. The Babson Economic Service issues specially coloured maps on these lines, from which it is possible to obtain a pretty accurate idea of business conditions all over Northern America, but as far as the author knows this work has not been gone into to any extent in this country.

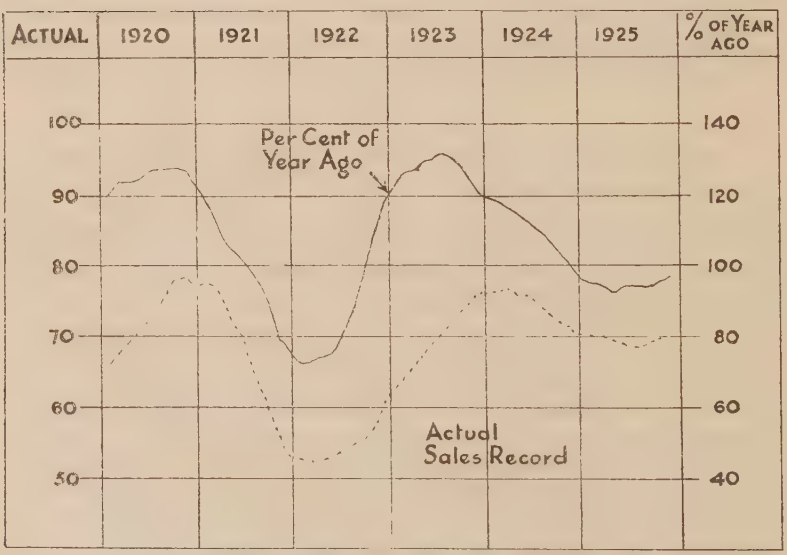
Research Work.

It would seem only natural that the research department should work in very close alliance with the Information Bureau. In fact the Information Bureau can itself undertake certain types of research work; it should for example be in a position to tackle such problems as those of distribution, which have been badly neglected in the past.

The Information Bureau is the natural outcome of an age whose faith is pinned to specialisation, yet curiously enough it will only be a success in the hands of a man whose interests are so wide that his mental outlook can embrace the past, the present and the future. Perhaps that is why two instances have recently occurred in this country where the Heads of Information Bureaux have been translated to a higher sphere—on to the Boards of Directors of their Companies. When all is said and done scientific business methods are nothing more than inanimate tools, only to be ground and sharpened by the motive power of the human brain.

Diagram 1.

FORECASTING OF SALES.



The two curves are based on the same original record. The upper curve represents the percentage of the figure for each month compared with the same month a year ago.

Diagram 2.

THE BASIS CURVES FOR BUSINESS FORECASTING.

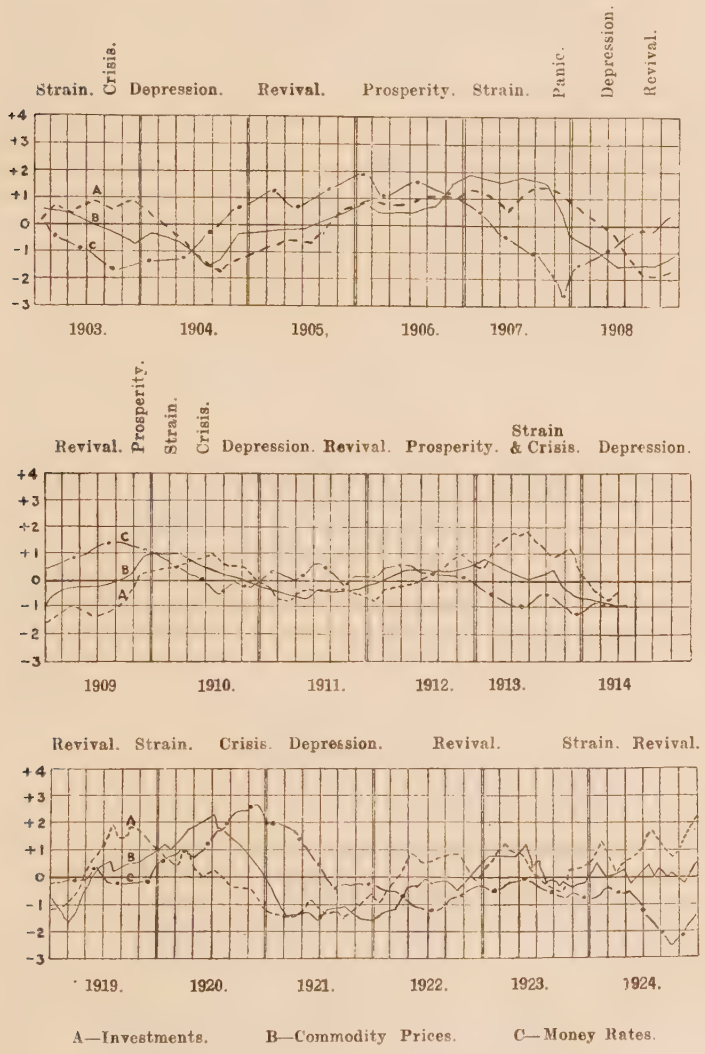


Diagram 3.

Datal Serial No. . .

NAME.

DAILY DIGEST.

FOR DIRECTORS AND STAFF.

0 1 2 3 4 5 6 7 8 9 0

Dec. Class No.

SUBJECT. Main—

Sub. —

Year. Month. Day. Page.

TITLE.

AUTHOR.

PUBLICATION. Illus. Diagrams. Words.

DIGEST.

---

0 1 2 3 4 5 6 7 8 9 0

Dec. Class No. 621.312.

SUBJECT. Main.—ELECTRICAL ENGINEERING
Sub. —CENTRAL STATIONS.

Year.	Month.	Day.	Page.
26	8	6	211

TITLE. ELECTRICITY SUPPLY AT LIVERPOOL

AUTHOR.....

PUBLICATION.	Illus.	Diagrams.	Words.
Electrical Review.	10	...	1,000

DIGEST. An account of the recent extensions of the City Corporation's Undertaking.

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0 1 2 3 4 5 6 7 8 9 0

Dec. Class, No. 636.414

SUBJECT. Main.—PIGS.
Sub. —FEEDING.

Year.	Month.	Day.	Page.
26	8	...	83

TITLE. SCIENTIFIC PIG FEEDING.

AUTHOR. J. Hainstock-Anderson, N.D.A.

PUBLICATION.	Illus.	Diagrams.	Words.
Electro-Farming.	1	...	900

DIGEST. A description of the scientific methods of Pig Feeding carried out at the Hampshire County Institute.

The Vee notch is supposed to be cut out with scissors to facilitate filing by making sure that all cards of the same class are together.

Mr. S. J. NIGHTINGALE (Metropolitan-Vickers Electrical Co. Ltd., Manchester) raised a point in connection with the translation of foreign literature and the trouble experienced in getting the right type of worker to undertake it. The difficulty was summed up by saying that it was very rare to find in one man the ability to translate well from several languages and the requisite scientific and technical knowledge to put into good English the proceedings of foreign learned societies.

One way of achieving this object which was being tried with some success was to afford linguists the opportunity to study technicalities by giving them a course of instruction in the works, with the object of familiarizing them with engineering processes and their nomenclature in the various languages at their disposal. He asked what had been the experience of the authors in this respect.

Later, Mr. Nightingale made a plea for this Association to give its support, in some form or other, to a movement urging upon the Board of Trade and the Department of Overseas Trade the need for statistics, particularly with regard to industrial production in this country. It would seem reasonable to request that the statistics should be available to all British industry without payment of fee or the resort to back door methods, seeing that similar figures are available sooner, and for the asking, from such countries as Italy and Germany.

Mr. F. K. NEATH, B.Sc. (British Cast Iron Research Association, Birmingham) asked Dr. Pickles what he considered would be the view of the trade journals on his proposed publication of statistics and commercial matter. Generally the trade journals did not like the Research Associations to develop on this line which they considered their own field. In any case a good trade journal should supply this need, but perhaps the Rubber Industry lacked such a journal.

Mr. J. A. McILVEEN (Messrs. Cadbury Bros. Ltd., Birmingham) recalled the fact that Dr. Pickles had spoken of the abstracting of references dating back some sixty years as a matter of some difficulty and raised the question of value for money.

Later in the discussion it was stated that in a concrete case (where thousands of pounds had been spent) the finding of an old German reference had prevented further money being wasted in the pursuance of this line of research.

Mr. McIlveen also instanced Mr. Henry Ford's outlook on failures, pointing out that he kept no record of failures and was always willing to consider trying out proposals made.

Mr. CHARLES E. HECHT, M.A. (Food Education Society Incorporated), said that the system of technical education established in Munich under Dr. Kirchen Feiner, Director of Education, of which he saw something at Christmas, 1913-1914, attracted world-wide attention. More than one volume published in England was devoted to the subject. The Japanese who, according to the Director, entirely recast their educational system three times, finally based it upon the German, and drew largely upon the methods and experience of Munich.

Mr. W. A. COOKE, B.Sc. (Econ.) (Business Research Association of Great Britain) asked Mr. Borlase Matthews whether Chart No. 1. purported to represent a forecast for an individual business or for the industry of which it formed a part. His difficulty had always been to see anything but a general connexion between curves like No. 2 and the fortunes of a special enterprise. After all what the Directors or Managers of an individual business required was an intelligent forecast of their own sales and not of business generally or of the industry of which they formed a part. Most people actively engaged in business seemed to share their difficulty.

He also referred to Mr. Nightingale's remarks regarding the training of translators and asked whether the firms in question made any stipulation as to length of service after the training was complete or whether the men were free to go to competitive firms just when they were likely to be of real service to the firm that had trained them.

Major E. L. SELLARS (Messrs. Brunner, Mond & Co. Ltd., Northwich) in compliance with Dr. Hutton's request for observations on the extent to which Information Bureaux were appreciated by business firms and others, said that he had no hesitation in stating that from his experience the work of organizing technical information was fully recognized, and the Information Department played a very definite part in technical progress. Concerning the value of old information, he was convinced that such information might often prove to be of the highest value and should be indexed with the greatest care, provided of course that it was not out-of-date.

Mr. A. W. BURTON (Department of Overseas Trade) replied to Mr. Nightingale's strictures against the lack of up-to-date British official statistics of production and trade, and suggested that the United Kingdom was in no worse position than other countries.

He also considered that Dr. Pickles would have some difficulty in filling his periodical survey of commercial intelligence with particulars not already available in other journals; the securing of statistics from foreign countries was a particularly heavy task.

Dr. R. S. Hutton (British Non-Ferrous Metals Research Association, Birmingham), Mr. A. R. Barnes (Messrs. George Philip & Son, Ltd.), and Mr. H. Quigley, M.A. (British Electrical and Allied Manufacturers' Association) also spoke.

Mr. BORLASE MATTHEWS in reply to the discussions said that out of the somewhat lengthy title of this Association the last two words seemed to be the Cinderella of its work, since the subject of Information Bureaux seemed to be rather neglected. Hence his present paper.

Arising out of the difficulty concerning the obtaining of data, mentioned in the discussion, he pointed out that it was this very difficulty that provided the raison d'être of an Information Bureau. It was the business of such a department to obtain particulars upon which other members of the staff could not readily lay their hands. The qualifications required for the Head of such a Bureau were very special. Personality counted for a great deal; much could be done by the exchange of data in a friendly way. Shrewd intuition was of the utmost value, and ladies, if they happened also to possess the necessary technical qualifications, would tackle the work very successfully.

Technical translations from foreign languages always presented difficulties inasmuch as no linguist was capable of doing this work unless he were fully acquainted with the technique of the subject.

Regarding the remarks made concerning the usefulness of an Information Bureau, Mr. Matthews pointed out that in its early stages it had a difficult and uphill task, for people did not readily recognize its existence. When they did realize it—they usually asked for data for which they themselves had searched in vain; the inquirers moreover were generally specialists in the subject. The regular dissemination of useful information in advance of the time when the recipients could obtain it, established confidence.

Of the diagrams given in the paper, number 1 was of a particular business, while number 2 was of a whole country. The latter was used to assist in correcting diagram one. Naturally there was a big gap between the two. No one could foretell the future but it was remarkable how close an approximation could be attained by the use of scientific methods.

Lately the forecasts he had prepared for Farm Food and Products prices had been 100% accurate. Even over a long period they had turned out to be very close to the mark. Of course it must be admitted that it was not so difficult to forecast semi-wholesale prices as it was to deal with real wholesale prices. He was acquainted with more than one factory planning office that worked on Information Bureau lines. They estimated very closely the sales of all their respective products, and also the market prices of the raw materials required. Afterwards they plotted the actual against the estimated curves, in order to check their methods. Such a system saved thousands of pounds per annum, and was of the utmost value to the firms in question.

One of the main objects of his paper was to draw attention to the true nature and real importance of the Information Bureau. In his opinion such a department should be much more than a mere machine for collecting data; it was of far more importance to try to estimate future tendencies with a view to providing a basis for new business. The Bureau would thus act as an essential feature of the firm concerned rather than merely as a handy depository of data in indexed form.

SECTION 3 - - - Saturday evening, September 25, 1926.

Chairman:
Sir RICHARD GREGORY, D.Sc., F.Inst.P., F.R.A.S.

INSTRUCTION IN BIBLIOGRAPHICAL TECHNIQUE FOR UNIVERSITY STUDENTS.

By Harold E. Potts, M.Sc. (Chairman of Convocation of the University of Liverpool).

This paper has been prepared under a deep sense of anxiety as to the general methods of University education, at all events in the modern Universities. The diagnosis of the disease and the possible remedy are both so simple that it would appear superfluous to write a paper on the subject were it not for the fact that but little public attention is apparently being given to the aspect of the problem which I propose to discuss. Although members of the conference will probably regard my remarks as platitudes, the fact remains that they deal with a neglected subject.

The object of this paper is to urge that all University students should be given some instruction in bibliographical technique. These words are used in the broad sense and not as referring to the minutiæ of bibliographical science or to instruction of the scope required by professional bibliographers. What is meant is simply that all students should be able to use a library intelligently and, what is perhaps more important, that they should acquire the habit of using a library. Provided they do acquire it, they may learn how to obtain benefit from it by the assistance of the trained staff. Solvitur ambulando.

In making this plain statement I fear that members of the conference will experience a sense of surprise that anyone considers it necessary to say something which is so self-evident. Nevertheless I repeat that sufficient public attention does not appear to have been given to the fact that the Universities must be turning out hundreds of graduates who have never truly realized that problems can be solved with the help of books. This may seem a bold remark as applied to a class of men and women all of whom are presumed to have spent at least three years in absorbing the contents of books. Those who have acquired the habit may find it difficult to throw themselves mentally into the position of others. Nevertheless I assert with confidence that many students know that textbooks exist in their prescribed course, but do not know, at any rate in the practical sense—i.e. the sense of acting on the knowledge—that books, monographs, journals, etc., exist on practically every subject, and further that it is necessary to consult subject journals and other "sources." This is mainly due to a complete failure to realize what "the literature" on any subject can do. It may also be due to faulty appreciation of the fact that if one desires to obtain information on any given subject, the surest method for the average man is to use a library and not to endeavour to obtain oral information. Oral instruction

is doubtless the best when it is individual and when it is given by a first-rate authority with sufficient time at his disposal; but these conditions rarely coincide in actual life. Students may appreciate this for the usual theoretical subjects in which well-known text-books exist (for example, history and mathematics), but they fail to realize that the principle also applies over the whole range of human activities and natural phenomena, whether for abstract subjects such as ethics or æsthetics, industrial subjects such as chemical technology and mass production, the subjects which adorn life such as literature and the classics, or finally the modest but agreeable subjects such as gastronomy and œnology.

In a short paper, I cannot elaborate further reasons for my belief, and I will therefore content myself with the somewhat dogmatic statements I have already made, though it is quite clear that many of the audience will be able to give these reasons more forcibly than I can myself on account of their wide knowledge of the abysmal inexperience of the many who consult them.

If this be so:—

(a) What is the reason for such an alarming state of affairs?

(b) What remedial measures can be taken?

In considering the reason for the ignorance of students as to the possibilities of bibliography, I am inclined to air a heresy and to suggest that the modern Universities have gravely over-emphasised the importance of lectures. I feel that the ordinary lecture is as much of an anachronism as the wax tablets and stylus, and further that the Universities in their excessive respect for the lecture tradition have never fully grasped the fact that this tradition should be reconsidered in the light of the invention of printing. From the moment the printed textbook became available, the Universities should have revolutionised their methods of teaching. Whether they did or not at the time, I am not sufficient of a historian to state, but taking the position as it stands to-day we find that substantially the same ground is traversed by innumerable lecturers when the major portion of their work probably has been, or certainly should be, embodied in printed documents.

I must admit against myself that some students are aurals who absorb instruction better through the ear than the eye, and are thus unlike the visuals. But for the latter at any rate, the ordinary lecture is a serious waste of time. The superstition that a course of lectures should take the place of a textbook should now be finally exploded.

It seems clear to me that suitable textbooks should be used for the greater part of the heavy work of instruction and that the function of the lecture should be first of all to stimulate the student, then to prescribe reading and send him to the literature at once, then to show him how to read and finally to comment on what he has read. The best lecture is that in which the student feels the impact of a forceful or fascinating personality. Such lecturers must be rare, but any lecturer can take the literature as a basis and embroider it with explanations and amplifications which will be of interest and value. Surely it should be obvious that the main body of information should be obtained by the student from the books and that the lectures should serve as a stimulant, as a guide, as a commentary, but on no account as a mere substitute.

Whether this explanation be accepted or not, a study of the University system, coupled with some practical experience as a student and as an administrator has satisfied me that the difficulty really exists. Let us now turn to the possible remedies, though unfortunately it is by no means easy to apply them successfully in practice. The substitution of seminar classes for lectures is extremely attractive to those who have not had the unfortunate experience of contending with the financial stringency in the modern Universities. Excellent as the seminar system is, I fear that its thorough introduction into the modern Universities would be completely impracticable on account of the increase in teaching staff if the system were to apply, as it should be applied, to all students and not merely to those engaged in honours and research work.

Two practical remedies appear possible:—

(a) Lectures should be modified as far as possible in the direction indicated. Some of the best lecturers follow this plan, but others are doubtless deterred because they fear that their students will desire lectures on the old style as a substitute for textbooks. These students should be shown that their ideas are unsound, and special attention should be given in each course to indicate the nature of the authorities, where to find them and how to use them.

No doubt individual University teachers will maintain that their own lectures do give informal instruction in this way, but they will all probably agree that the lectures of their colleagues might be improved in this direction. I concur.

(b) It would also appear that a few special lectures should be given each year on the bibliographical problem as indicated in this paper. It is hoped that some suggestions will be made in the discussion as to the best method of organising such lectures, for example whether they should be given by members of the Faculty working in conjunction with the library staff.

A very striking illustration of such lectures is the course on chemical literature by Miss Marion E. Sparks, of the University of Illinois. This has been published in book form.

It may be added that the Committee of Convocation of the University of Liverpool, i.e. the Statutory body representative of graduates, has presented a memorandum on this subject to the University Library Committee. This memorandum met with a sympathetic reception, and it is hoped that certain arrangements will be made in the near future which will supplement steps already taken by the University Librarian.

The problem is however very difficult because the machinery of University government is exceedingly complicated and the governing bodies are perhaps inclined to be conservative, so that much time and effort would be required before any far-reaching change could be effected, especially since these proposals may be resented by some of the academic members on the ground of possible interference with their methods of lecturing.

In spite of all these difficulties, I feel strongly that some action is necessary. Apart from research, the main body of University training is either cultural or vocational or both. For cultural

training it is immediately apparent that the student must learn how to learn in the future rather than aim at acquiring a body of fact-information. It is not so generally realised that this statement is also true for vocational training. If we are training a chemist or an engineer our object should not be to teach a repertoire of professional tricks, but to teach the student how to learn in after life during his professional career. It is impossible to turn out a chemist or engineer who can at once apply his knowledge to industry over a wide range without long practice, investigation or research. The University career lasts three to five years, and in that relatively short fraction of his life the student cannot possibly acquire all the fact-information he will ultimately need. Hence the aim of the instruction should be to enable the student to learn for himself in after life. In many cases this learning will be from books rather than from persons, and accordingly University instruction should prepare adequately for this post-graduate career. The ideal teacher will remember that he will not usually be available to the student after graduation and therefore the teacher will aim to teach his students to teach themselves. In other words, the object of the lecturer should be to make himself superfluous. Vocational training should therefore include:—

(1) The obvious substratum, namely, fact-knowledge and professional information,
(2) A training in scientific method, and
(3) Some explicit training in the use of books.

Thus, as post-graduate self-instruction must be largely derived from books, bibliography should be an integral part of University teaching *for all students* and not merely for research and honours students. Although some teachers are inclined to think that the art of consulting books is innate, members of this Conference will at once agree that there does exist a real technique of which even an elementary knowledge is useful, and therefore that such technique should be taught.

In conclusion, it is desirable to point out that if all students could be given fuller information on these lines, it would increase the status of the librarian. He is a professional who cannot be superseded by the mere amateur. It is true that the professional may consider that he cannot be expected to give away the secrets of his technique to the public. I believe however that, apart from any altruistic considerations, this point of view is quite erroneous. Although some portion of my own emoluments is derived from arranging for searches in literature, I should welcome any scheme which encouraged chemists and engineers to study the literature more fully for themselves. On professional technique in general my practice has been to give information to my clients very freely. I have found that usually the best clients are those who know most about my subject, because it is they who realise the complexity of the problems on which they require the collaboration of a specialist who devotes his life to that particular profession.

It is hoped therefore that librarians will co-operate to the fullest extent in the directions suggested in this paper, partly by lending their influence in support of proposals and partly by assisting in giving the necessary instruction. The first requisite is that there should be an adequate discussion.

Mr. H. ROTTENBURG, M.A., M.I.E.E. (Engineering Laboratory, Cambridge University, etc.), who presented the paper in the absence of the author, said that some lecturers, when asked to give a course of lectures, felt that they had to fill in the time with long readings from textbooks and not with guidance as to where the students could find the materials of study. The students took laborious notes, which were quite unnecessary, because the whole thing was, of course, already in print. His experience was that when students left the lecture-room with voluminous notes they knew nothing at all about the lecture they had attended.

Sir RICHARD GREGORY, D.Sc. F.Inst.P., F.R.A.S., in opening the discussion said Mr. Potts' proposal would mean a revolutionary change in university teaching methods. He himself whole-heartedly agreed that students should be encouraged to go direct to the sources. This method had been practised with great success by the late Sanderson, of Oundle. Students would be far better sitting in their rooms reading quietly over a pipe than attending lectures, which consisted merely of long recitations from textbooks. The only justification for a lecturer was that he should give inspiration. At some of the London medical schools students were there simply to pass examinations. The lecturer was quite independent of the examinations. The result was that some of the students simply came to the lecture-room to sign the register and then escaped immediately and did their work for examination purposes under an outside crammer who specialized in that sort of thing.

Dr. E. A. BAKER, M.A. (London University School of Librarianship), said he thought that the state of things complained of by Mr. Potts was passing away, and in many colleges had already become obsolete. The method of the lecturers, for example, at University College, London, was to guide and suggest, stimulating the student to do the work himself. As a great authority had recently said, the student in a school looks to the teacher; the University student and the Professor both look in the same direction and are both intent on the pursuit of knowledge. Librarians had considered the problem for very many years. Several decades ago, the late H. R. Tedder urged that bibliography should be taught universally. Even in the elementary school, children should be taught how to use books and how to use the library.

Dr. Baker called attention to a book now in the press, *The Uses of Libraries,* the object of which was to show readers and students of all kinds how to read, how to use works of reference, and how to get the very best out of libraries of every kind.

Mr. F. BULLOCK, LL.B., F.C.I.S. (Royal College of Veterinary Surgeons), said he could assure Dr. Baker, as a recent student at University College, that even at that College, there were still lecturers who lectured in the same style as that condemned by Mr. Potts. In some subjects, the lecturer would say that there were no reliable textbooks and that the student must be careful to attend regularly and take copious notes. In others, the lecturer would say there were many textbooks but none of them satisfactory or entirely reliable. When it was remembered that the student was there for the purpose of passing his examination it was obvious he *must* take copious notes for he would find that the examination questions were based on the lectures. If he neglected taking notes and read any of the voluminous textbooks on the library shelves he might learn more of the subject and get really a better education but would have a poor chance of passing examinations. Mr. Bullock agreed that Mr. Potts' ideal was one of which they as Librarians ought to approve, but as things were at present he feared it would be a very long time before such an ideal could be realized.

Mr. D. H. LOW considered it was an amazing supposition to make at Oxford, and particularly at Balliol, that lecturers read out chunks of textbooks, and undergraduates handed up chunks of these lecture notes in their Final Schools. It was not the case at Oxford and he wished to support Dr. Baker very heartily in disclaiming such methods at any rate in the School of Librarianship, at University College.

Mr. L. C. WHARTON, M.A. (Philological Society, etc.), in supporting the thesis of Mr. Potts, pointed out that in Oxford for instance, lectures were of two kinds. One was in and for the members of one College and was rather tutorial in character. The other was the Public Lecture proper and the College Lecture designed for general use. These latter were intended to wake people up and give them an idea of the field to be covered, with copious references to books that one ought to read and study. Indeed the best lecturers warned their hearers against the textbooks used in the Schools. In London he had found the most astonishing evidence of the need for giving some training to students—and lecturers!

Mr. R. L. SHEPPARD (Bureau of Hygiene and Tropical Diseases) suggested that the impression to be gained from reading reviews written by experts of books on their own subjects was that few books in the opinion of the experts reviewing them were free from pitfalls. If these expert reviewers were right it would seem that a lecturer who referred students to the existing literature for the main body of information on a subject would need to devote a large part of his lectures to guarding students against these pitfalls in the writings of others. This might be a reason why certainly in the case of intensive courses of study, lecturers preferred to give students comprehensive oral information rather than send them, with a long list of errata, to study the literature themselves.

Recognizing the desirability of instruction in bibliographical technique, the Director of the London School of Hygiene and Tropical Diseases had arranged for the School Librarian to give demonstrations to the students at the School each session on the uses of the Library and its various bibliographical aids.

Mr. J. Wilks, M.A. (University College, London), Mr. W. S. Jarratt (H.M. Patent Office), Miss K. M. Baverstock (Medical Research Council), and Mr. W. L. Cooper, M.A. (Bristol University) also spoke.

* * * * * *

Mr. Potts wrote later that he was surprised and pleased to find so much support for his views, which apparently were not so heterodox after all. Some speakers had referred to an alleged accusation that lecturers were in the habit of repeating "chunks of textbooks"; this accusation might or might not be true, but no such suggestion was made in the paper. Mr. Potts did not wish to criticize individual lecturers, but to deprecate the way in which many students were in the habit of using their lecture notes as a substitute for reading a textbook. In Mr. Potts' view the lecture should be a commentary and a stimulus; the lecturer should not merely traverse the same ground as existing textbooks, even if the method of treatment were his own. Possibly some help might be afforded if the lecturer were to distribute mimeographed abstracts containing references to the sources so that the actual lecture could be more discursive and less systematic than usual. Unfortunately, there were serious practical difficulties in making any comprehensive change and Mr. Potts fully agreed with the Chairman that any such change would be almost revolutionary.

REPORT OF THE FIRST ANNNAL GENERAL MEETING.

Sunday morning, September 26th, 1926.

This was open only to Members and Associate Members of A.S.L.I.B. and was held in the Hall of Balliol College, Oxford. About fifty members were present, including the following members of the Council :—

Mr. F. W. Clifford.
Mr. Percy Cohen.
Mr. H. Vincent Garratt.
Sir Richard Gregory.
Mr. L. Honeyburn.
Dr. R. S. Hutton.
Miss A. L. Lawrence.
Brig.-General Magnus Mowat (Hon. Treasurer).
Mr. S. J. Nightingale.
Mr. P. K. Turner.
Dr. J. C. Withers.

Dr. R. S. Hutton (British Non-Ferrous Metals Research Association, Birmingham) took the chair.

AGENDA.

1. Chairman's remarks.
2. Financial statement for the half-year January 1st to June 30th, 1926.
3. Membership.
4. Constitution : Consideration of draft.
5. Election of Council.
   Election of Officers.
   Election of Auditors.
6. Directory.
7. Formation of Local Committees.
8. Policy : Discussion.
9. Fourth Conference : Location.
10. Messages to American Library Association and Special Libraries Association, meeting at Atlantic City, October 4th—9th, 1926.
11. Other business.

Item 1.

The CHAIRMAN said that this Meeting was to consider the formation and constitution of the Association. A meeting had been held on March 29th, 1926, when certain resolutions were proposed and passed. It had then been decided that an Association should be formed and it came into existence from that moment; the meeting had approved the draft constitution that was then submitted insofar as the objects of the Association, the classes of membership and the rates of subscription were concerned. It had further been decided to submit the draft constitution in its entirety to this present meeting.

The CHAIRMAN then called upon the Honorary Treasurer to present his Report.

Item 2.

The HON. TREASURER (Brig.-General Magnus Mowat) reported that the Balance Sheet (printed at the end of this Report of the Annual Meeting, see page 100) had been circulated to all Members. The work of the Directory had been organized apart from the general work of the Association and separate accounts had accordingly been kept. The credit balance on the General Account amounted to £88 1s. 8d. He had received a cheque for the final instalment of the grant from the Carnegie United Kingdom Trustees. There was, therefore, no fear for the immediate future as to the carrying on of the work of the Association and, he hoped, its extension. He pointed out, however, that it was very necessary to increase the Membership so that when this grant was exhausted the Association might be self-supporting.

With regard to the Directory, he reported that on 30th June there was a credit balance of £416 14s. 4d.

In submitting these accounts, the Hon. Treasurer expressed the hope that they would receive the members' approval. They had been duly audited by Messrs. West and Drake, Chartered Accountants.

It was proposed by the CHAIRMAN and seconded by Dr. BAKER.

> That the Honorary Treasurer's statement be duly accepted and entered on the Association's records.

The Resolution was carried unanimously.

Item 3.

The CHAIRMAN reported that the Membership amounted to nearly 100, and that a few additions had been made during the Conference. He pointed out that it was of great importance that a far larger Membership should be secured if the Association was to become self-supporting and was to carry on its growing work. The Association was at present depending on a grant from the Carnegie United Kingdom Trust, which must be replaced by Membership subscriptions.

Mr. HEADICAR asked if any special appeal for membership had been made.

The CHAIRMAN replied that about 4,000 leaflets had been distributed but suggested that individual persuasion by Members would be very helpful.

Item 4.

The CHAIRMAN gave his report as follows:—

"We have had the good fortune to be assisted in this connexion by Mr. Percy Cole, our Solicitor, who is present at our meeting to-day. He has had a wide experience in drafting

constitutions of this kind for associations such as our own, and the Council is convinced that the draft embodies our aims and objects correctly; it will be of assistance to the Council, however, if Members would kindly raise any points that occur to them now.

The main features of this Constitution are that it sets out :—

(a) The objects of this Association (Clause 3). Your attention is particularly drawn to this section.

(b) The conditions of Membership (Clause 7). You will note that there are three classes of Members—Honorary Members, Ordinary Members and Associate Members—involving three different obligations and three different advantages. (See Clause 11 and following clauses.)

(c) The constitution of the Council (Clause 16 and following clauses). The attention of the meeting is called to the small addition which it is suggested by the Council should be adopted in Clause 17. This clause at present reads as follows :—

> 17. Until otherwise determined by a general meeting, the number of the members of the Council, exclusive of the honorary officers shall not be less than 11 and more than 20 who shall be ordinary or associate members of the Association and/or nominated representatives of such members being bodies corporate or not corporate.

It is considered desirable that the number of members of the Council should be increased from 20 to 30. With regard to the mention of 'associate members of the Association' (who at present represent about 10% of the total membership) it is suggested that the following words should be added :

> provided that the number of members of the Council who shall be Associate members shall not, unless otherwise decided by the Association at any General Meeting, be more than three in number.

(d) Regulations governing procedure of General Meetings and the election of the Council (Clause 47 and following clauses). I think this carries out the views that have been formed and I hope they will be acceptable. With regard to the President and Vice-presidents, so far we have not elected these officers, but since, in drafting a constitution, it is advisable to look ahead, this Clause has been inserted.

There are two other minor alterations which the Council has added to the draft and wishes to put before you. Clause 45(a) reads at follows :

> 45(a). The Association may at any ordinary meeting appoint as honorary officers one president and such number not exceeding vice-presidents as may be deemed expedient and an honorary treasurer and/or an honorary secretary. Each such honorary officer shall hold office until the next annual general meeting or until a successor shall have been appointed in his stead. They shall be eligible for re-election but except in the cases of the treasurer and secretary shall not hold office for more than two consecutive years unless the Association in general meeting otherwise decide. The honorary officers shall be *ex-officio* members of the Council and of the Association but unless otherwise personally qualified shall have no right to vote at any such meetings. It shall not be necessary for any of such officers to have any qualification for office either by way of subscription donation or otherwise or as a member of any class.

It is suggested that the word 'three' should be inserted in the blank space on the third line.

The other alteration is in Clause 60, which at present reads as follows :—

> 60. Except where otherwise provided by these presents at all general meetings a resolution put to the vote of the meeting shall be decided on a show of hands by a majority of those present and entitled to vote unless before or upon the declaration of the result of the show of hands a poll be demanded by the chairman or in writing by at least three persons present and entitled to vote, and unless a poll be so demanded a declaration by the chairman of the meeting that a resolution has been carried, or has been carried by a particular majority, or lost, or not carried by a particular majority, shall be conclusive and an entry to that effect in the minute book of the Association shall be conclusive evidence thereof, without proof of the number or proportion of the votes recorded in favour of or against such resolution.

The Council proposes that the words : 'at least three persons present' should be altered so as to read : 'at least five persons present.'

It is possible that on further consideration the Council may desire to alter some of these clauses but the resolutions that have been drafted will give it power to make minor alterations.

The draft constitution for which the Council asks your approval is that which is before you in printed form, subject, however, to the small modifications already mentioned."

The CHAIRMAN then invited questions.

Concerning Clause 45(a) :

Mr. ROTTENBURG asked if it were not proposed to add the word 'honorary' to the words 'President' and 'Vice-presidents.'

In reply Mr. COLE said the intention of the clause was that the President and Vice-presidents should be Honorary Members of the Association and not necessarily subscribing members.

Mr. ROTTENBURG proposed that the number "three" for Honorary Vice-presidents should be increased inasmuch as the Council seemed to be tying its hands as to the number it could elect.

Mr. JAST suggested that the Council was unnecessarily restricting itself in making any limitation to the number of its Vice-presidents and proposed :

> That the words 'not exceeding three' should be eliminated and the word 'of' substituted.

This resolution was seconded by Mr. ROTTENBURG, carried unanimously and reported to the Council for action.

Concerning Clause 17 :

Mr. ROBSON expressed the view that an 'Honorary' Member might become a Member of the Council ; he suggested that in front of the word 'ordinary' should be inserted 'Honorary or' as it would not be desirable to exclude Honorary members from membership of the Council.

Mr. JAST suggested that if an Honorary member wanted to retain an active interest in the Association he could remain a subscribing member and in that case become eligible for the Council. He also suggested that the different classes of members should be represented on the Council in a definite proportion.

The CHAIRMAN pointed out that the words " Until otherwise determined by a General Meeting " governed the whole of the Clause and that the point could therefore be raised later. The question regarding Honorary Members might be left to the consideration of the Council as this alteration would upset various other clauses of the Constitution. This course was agreed upon.

Concerning Clause 3 :

Mr. HEADICAR raised a question upon the paragraph reading :

> Provided that the Association shall not support with its funds any object, or endeavour to impose on or procure to be observed by its members or others, any regulation, restriction or condition which if an object of the Association would make it a Trade Union.

asking whether this implied that the Association could do nothing whatever to protect the rights of a member suffering from unfair treatment professionally.

Mr. COLE explained that from that proviso to the end of the Memorandum the statutory formulas required by the Board of Trade had been used; these clauses were essential if the Board of Trade was to be asked to give its consent to the elimination of the word " limited " at the end of the title of the Association. He added that the Association could not interfere with the conditions and terms of employment as between a Member and his employer.

After further discussion on minor points the CHAIRMAN submitted the following Resolutions to the meeting :

> (i) That the Association known as the 'Association of Special Libraries and Information Bureaux' be registered under the Companies Acts, 1908 to 1917, as a company limited by guarantee and not having a capital divided into shares, and that application be made to the Board of Trade for a licence directing the registration of this Association with limited liability, without the addition of the word 'limited' to its name.

This resolution was proposed by the CHAIRMAN, seconded by Mr. SANDERSON, and carried unanimously.

> (ii) That the draft Memorandum and Articles of Association submitted to this Meeting be approved as the Memorandum and Articles of Association of the proposed Company subject to such amendments or variations of such draft as may be requisite or deemed expedient for the purposes of registration by the Council of this Association and the Council is hereby authorised to make or approve such alterations to this draft as in its absolute discretion it shall think fit.

This resolution was proposed by the CHAIRMAN, seconded by Mr. COLE, and carried unanimously.

Item 5.

Election of Council.

The CHAIRMAN explained that the Council elected to-day would become the first Council of the Association and would continue in office until the next Annual General Meeting. He regretted that he had two resignations to convey to the Meeting, those of Major W. E. Simnett and Mr. Sinclair Wood, to both of whom the best thanks of the members were due for their valuable assistance in the preliminary work of the Association.

It was proposed by Mr. JAST and seconded by Dr. BAKER

That the present Council be re-elected.

This Resolution was carried unanimously, and it was agreed that the two vacancies following on the resignations of Major Simnett and Mr. Wood should be filled by co-option.

Election of Officers.

The CHAIRMAN said he had much pleasure in proposing

That Brig.-General Magnus Mowat be asked to continue to hold the office of Honorary Treasurer.

This resolution was seconded by Miss MARKS and carried unanimously, the members expressing their best thanks to General Mowat for the great help that he had already given the Association.

The CHAIRMAN then read a letter from Mr. A. F. RIDLEY, tendering his resignation from the post of Honorary Secretary owing to his residing away from London, and the consequent difficulty of keeping closely in touch with the work and development of the Association.

It was proposed by Mr. BARNES and seconded by Mr. SPENCER that Mr. Ridley be asked to reconsider his decision.

Mr. JAST expressed the view that the appointment of an Honorary Secretary was important to the future of the Association; he presumed that Mr. Ridley had resigned his position because of his inability to attend meetings regularly, and moved as an amendment that it should be left with the Council to consider the advisability of asking Mr. Ridley to reconsider his decision.

This amendment was seconded by Mr. ROTTENBURG and carried.

Mr. TURNER had the enthusiastic support of all present when he suggested that the Council should be asked to convey to Mr. Ridley their warm appreciation of the work he had done.

Election of Auditors.

Mr. FOSTER SPROXTON proposed

That Messrs. West and Drake, Chartered Accountants, be elected Auditors to the Association.

This was seconded by Mr. SPENCER and carried unanimously.

Item 6.

Mr. ROTTENBURG suggested that the Glossary of Technical Terms used in connection with indexing and library work in different countries, which was now being compiled by the League of Nations, should be added to the Directory.

The CHAIRMAN replied that the Council would consider this suggestion.

Mr. JAST intimated that many members of the Association thought that the Directory was going to include special collections of objects, such as Museum objects.

The SECRETARY replied that this misunderstanding was probably due to the notices appearing in the Press. After detailed consultation with the Carnegie United Kingdom Trust the Editor of the Directory was concentrating in the first instance on special collections of books and material in special and general libraries.

Mr. ROTTENBURG said he believed the Museums Association was getting out a Directory of special collections; if this were so he considered there should be a reference to it in the Association's Directory.

Mr. TURNER thought it undesirable that any extensive reference to collections of objects should be made but said that a decision on the point ought to rest with the Editorial Board.

Mr. JAST asked the Meeting to express an opinion on what he regarded as an unfortunate extension of the field of the Directory; it was going outside the scope and any attempt to cover such an enormous field would prove unsuccessful. He would like to suggest that collections of objects be rigorously excluded.

Mr. ROTTENBURG suggested that the scope of the Directory should be limited to the written or printed word.

Mr. HEADICAR pointed out that there were collections of objects in the possession of certain firms, a knowledge of which would be of considerable value to the economic and industrial world.

Mr. ROBSON thought that the whole question had better be left open but mentioned that where Museums published Catalogues these might be included in the Directory.

The CHAIRMAN considered that a decision on the whole matter might usefully be left to the strong Editorial Board that had been set up and to the Carnegie United Kingdom Trust.

Item 7.

This item was passed over without comment except that Mr. ROTTENBURG said that it would be helpful to compile a list of Members under towns since some of them would no doubt be willing to give information regarding the Association's activities to potential members in their neighbourhood.

Item 8.

No comments were offered.

Item 9.

The SECRETARY reported that Edinburgh, Cambridge and Oxford had been all suggested as possible centres for the Fourth Conference.

The Meeting agreed that this question should be left to the Council for decision.

Item 10.

It was decided that cablegrams in the following terms should be sent to the American Library Association and to the Special Libraries Association both meeting at Atlantic City, October 4th—9th, 1926 :—

> "Best wishes for the success of Conference from Members Association Special Libraries assembled Balliol, Oxford."

This ended the business of the Meeting

ASSOCIATION OF SPECIAL LIBRARIES AND INFORMATION BUREAUX.

General Receipts and Payments Account, for the half-year ended 30th June, 1926.

DR. (abridged) *CR.*

RECEIPTS.	£	s.	d.	PAYMENTS.	£	s.	d.
To Balance at 1st January, 1926 ...	156	5	0	By Balance of cost of 1925 Conference (including printing of Report)	105	13	3
„ Carnegie United Kingdom Trust	375	0	0	„ Secretary's Salary	150	0	0
„ Membership Subscriptions to 30th June, 1927	12	12	0	„ Rent, Postage, General Office Expenses, etc.	220	5	6
„ Receipts from 1925 and 1926 Conferences	17	8	9	„ Balance at 30th June, 1926 ...	88	1	8
„ Sale of Reports of 1924 and 1925 Conferences	2	12	5				
„ Bank Interest		2	3				
	£564	0	5		£564	0	5

Directory Receipts and Payments Account, for the month of June, 1926.

DR. (abridged) *CR.*

	£	s.	d.		£	s.	d.
To Carnegie United Kingdom Trust	500	0	0	By Assistant Editor's Salary ...	29	3	4
				„ Rent, Postage, General Office Expenses, etc.	54	2	4
				„ Balance at 30th June, 1926 ...	416	14	4
	£500	0	0		£500	0	0

We have compared the above Accounts with the books and vouchers and certify the same to be correct.

26th August, 1926.

8, New Court,
Lincoln's Inn,
London, W.C.2.

(Signed) WEST & DRAKE.
Chartered Accountants.

MAGNUS MOWAT,
Hon. Treas.

GENERAL SESSION - - Sunday morning, September 26, 1926.

Chairman:

Sir RICHARD GREGORY, D.Sc., F.Inst.P., F.R.A.S.

THE LEAGUE OF NATIONS and the work of the INTERNATIONAL INSTITUTE OF INTELLECTUAL CO-OPERATION.

By DR. J. E. DE VOS VAN STEENWIJK
(Assistant Chief of the Section of Scientific Relations).

When I received an invitation to give you a short paper on the activities of the International Institute of Intellectual Co-operation, I felt not only honoured but also very pleased to have this opportunity of establishing personal touch with the members of your Association, the aim of which is so closely connected with a section of our own activities. In view of Professor Gilbert Murray's address at your meeting last year, I venture to infer that you desire this contact to become a regular feature of your meetings; I propose to-day to build on this assumption by asking your collaboration in a vital matter forming part of our proposals.

I regard it as a 'bonum omen' that the first point mentioned in Professor Gilbert Murray's address—a point proposed by one of your countrymen, Mr. Hagberg Wright—has now been realised. I have before me a pamphlet containing a list of 352 notable books published in twenty different countries during the year 1924; I expect that next year an even larger number of countries will be represented.

I do not propose to spend the time allotted to me in surveying the various matters that have received the attention of the Institute, but will confine myself to the one subject in which I expect you are most interested, namely bibliography. (A full report of the first year's activities of the Institute is now in the press.) May I ask your permission to dwell for a few moments on the general principles that govern the policy of our Institute. The Institute acts as the permanent bureau of the International Commission of Intellectual Co-operation which meets once or twice every year; its work consists primarily in preparing reports or executing resolutions on specific matters already approved by the Commission. The Institute has also a certain measure of liberty to initiate investigations on its own account; though necessarily of a provisional character these investigations may subsequently be endorsed by the Commission. Suggestions from different sides have not been wanting; indeed perhaps the most

difficult part of our task is the sifting of the raw material in the way of proposals that is continually pouring in. In the domain of science, to speak only of my own department, many propositions for the unification of terminology, for standardising units of measurement and even for creating international research centres have been received and examined. A few only of these have been brought before the Commission; a still smaller number has been retained for further study. I regard this restricted policy as wise, since if there is one thing that our Institute has to avoid it is acquiring the reputation of being meddlesome. Scientific workers strongly dislike being ordered about, even in regard to their technique, and it is only when there is a very considerable demand for external assistance that the Institute feels justified in taking action. To ascertain if such a demand exists for any of the schemes proposed is therefore one of our most important tasks; we shall be the better qualified to fulfil this task as we come gradually into closer touch with the various scientific circles of importance.

In the field of bibliography we have to be guided by somewhat different principles. Whilst on one hand bibliography has most certainly become a science, it cannot be denied that its principal aim is to serve the other sciences or rather intellectual activities. It cannot ignore their requirements, and simultaneously with its own development must give attention to suggestions coming from the outside world. We have now left far behind us the stage when a librarian considered it his first duty to defend his books against the curiosity of the public; as libraries become better organised as centres of information, the public is becoming more and more exacting, everyone wanting a library to be organised so as to meet his own particular needs.

The activities of the Commission and of the Institute in this respect have been twofold. These bodies have concerned themselves with the analytical bibliography of current scientific literature, and have inquired into the question of how far libraries throughout the world are able to act as information bureaux or centres of documentation. In the first case each science must be treated separately, the editors of scientific periodicals being the persons principally concerned, in the second case the matter needs to be investigated for each country separately and in this we have to enlist the help of the librarians.

With regard to analytical bibliography, Professor Gilbert Murray told you last year of the principles on which the Commission had acted and how Physics was the first science to be taken up. I may say that Economics has now been approached; following a report by Professor von Göttl Ottlilienfeld of Kiel the Commission has decided to invite the editors of six prominent abstracting journals in this science to meet at the Institute. The third sphere will be that of the biological sciences: a meeting of experts in these subjects is to be called next winter.

A new feature in this field is the starting of a powerful organisation in the United States, known as *Biological Abstracts*

which intends to publish yearly about 50,000 abstracts taken from 4,000 to 5,000 periodicals.

It may be advantageous to remind you that improvements in these matters do not always mean increased expense but may result in economy by avoiding unnecessary duplication of work. This is indicated so far as biology and medicine are concerned in a very interesting report* by M. Frémiet, secretary of the International Biological Union, who computes that on an average there appear each year 75,000 articles on biology, while the number of abstracts is about 222,500. Allowing half an hour for making each abstract, this represents 13,900 eight-hour working days of a trained scientist, the greater part of which is merely duplication.

I will conclude this subject by laying stress on one principle which is I think of vital importance if this problem is to be handled successfully. All editors of scientific periodicals should adopt the policy of publishing articles only if they are preceded by a short summary (made by the author) which gives sufficient particulars to enable the reader to judge whether he should read the article or not; this summary should always be written in a well-known language.

I now pass on to a subject which closely concerns those present—the organisation of libraries as information bureaux. Last spring we sent out a circular to some two thousand libraries throughout the world; there are two things we want to know: where are the best collections on specialised scientific subjects, and how far is each library able and willing to answer inquiries of a bibliographical nature? Some five hundred replies have been received and extracts from the most interesting are to be published shortly. This first publication will not claim to be a guide to scientists in search for information, but is intended merely to act as a stimulus to those librarians who have not yet answered, and to give some indication of the reception that this enterprise has met with amongst librarians.

In this work the Institute is advised by a number of competent experts including the Administrateur Général of the Bibliothèque Nationale, M. Roland Marcel; the Director General of the Preussische Staatsbibliothek, Dr. Krüss; the Director of the London Library, Mr. Hagberg Wright and the Director of the Schweizerische Nationalbibliothek, M. Godet.

The Commission is waiting for further replies before deciding the use to which this information shall be put; it is felt that the Institute might fill a useful rôle by acting as a clearing-house for the distribution of information of this character on an international scale. If however I may be allowed to express my personal opinion I should like to advance the view that the collection of information regarding the present library position would be best accomplished if in each country some central organisation were to take it in hand. We

* Comptes-Rendus de la troisième Assemblée générale p.52.

must make due allowance for the great variation in organisation in the different countries. In some countries (as in France for instance) the National Library is the most competent body to deal with the matter, and I am pleased to be able to make known to you the following translation of a circular sent by the French Minister of Instruction to the State and University Libraries and to the Bibliothèques municipales classés : you will see from this that effective collaboration with our Institute has already been started.

The Report is dated July 27th, 1926, and runs :—

"In taking upon herself the responsibility of providing a home for the International Institute of Intellectual Co-operation and at the same time guaranteeing the funds necessary for its continuance, France showed plainly the importance she attached to the idea of co-operation amongst the nations in the interests of peace and the value of such an organisation in the realisation of this ideal.

Her task however does not end there; she must contribute to the progress of the Institute by establishing constant collaboration between the Institute on the one hand and her national scientific institutions on the other, with a view to facilitating intercommunication and exchange with other countries to the benefit of intellectual workers the world over.

I am of opinion that the proposals formulated by the French Committee of Intellectual Co-operation and elaborated by a special commission could be realised immediately.

So far as France is concerned the intention is to collect and centralise all information regarding public libraries, noting their special features and any unique material (with the exception of manuscripts) that they may possess.

As the Bibliothèque Nationale is already equipped with an international loan service, the information might be classified, filed and preserved there under my control.

With such documents at their disposal scholars and research workers in all countries would be able to obtain, either personally or by correspondence the precise information they require; in addition, the information will be of value to the International Institute of Intellectual Co-operation.

May I beg you therefore to send by October 1st to the Administration of the Bibliothèque Nationale, 58 rue de Richelieu :

1. A card giving :—
   (a) the title
   (b) the address
   (c) the precise character of your library, indicating where necessary officials on your staff who are specialists in any particular subject.
2. A card giving the title of your library and mentioning briefly its special collections, rare works (excluding MSS) and unique collections ('collections uniques') relating to your town or district or any other special subject whether literary, historical, scientific, etc.
3. A card corresponding to each special collection or rare book ('ouvrage unique') indicating the name of your library in the lower right hand corner of the card.

The cards, when assembled and arranged at the Bibliothèque Nationale on the international model (125 mm. x 76 mm.), will constitute a three-fold card index of libraries in France and of their specific resources; they will facilitate research and should answer all the requirements of those in search of information.

I may add that in future, in the event of requests for information being received from foreign countries that involve exceptional labour, I shall decide as to whether a remuneration should be made to the librarian undertaking the work."

It would be rash to expect that all other countries could adopt the same method, but I anticipate that the Directory which your Association is publishing will be very helpful in the furtherance of our scheme; I have great hopes that your Association will be willing to support our proposals and make them known in your country.

Speaking internationally the information will have for the most part to be obtained through the post; it is necessary not only to ascertain where collections are housed, but also where the specialists or potential specialists are to be found who will answer correspondence.

I think it should be established as a general principle that information required should be paid for. Many librarians are quite willing to co-operate but have no funds available; and this difficulty would thus be solved. Such a service ought to be self-supporting; it can be liberally remunerated inasmuch as obtaining accurate bibliographical information often means the saving of heavy travelling expenses.

But I am perhaps going rather far into details. Let me conclude by indicating the goal I see before me. The scientist in search of information will know where to apply and will not have to write at random to ten or twenty different places, thus wasting his own time and that of other people. Experience will show the best way in which the project should be realised. The first thing necessary is to arouse interest in this problem in every country and to secure the assistance of authorities who will indicate how the scheme should be organised and adapted in that country.

There is one other thing I want to mention that is probably known to some of you already. At the Congress of Librarians that was held this summer at Prague it was decided to create a Federation of Library Associations with its seat in Paris, and the President of the French Association of Librarians, M. Henriot, was specially commissioned to represent this Federation at our Institute. I think that this Federation should be of great assistance in the work, and that we should congratulate the Congress on the initiative displayed.

I hope I have made it clear that if Libraries are to serve science and scientists, the Institute in its turn is ready to serve libraries and librarians and through them fulfil its task of furthering intellectual co-operation between the nations.

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Mr. B. M. HEADICAR, F.R.S.A. (London School of Economics and Political Science), gave further information with regard to the analytical bibliography of economics referred to on Page 4 of Dr. de Vos' paper. He said that he had the privilege of being the British expert on the Committee appointed by the League of Nations Committee on Intellectual Co-operation, and that it had been tentatively agreed to publish

with the help of publishers and authors in each number of *Economica* a list of books and articles in scientific periodicals dealing with economics and its many ramifications. There was nowhere to be found at present under one cover anything in the nature of a full list of articles on this important subject; such valuable work originated by the Institute should receive universal commendation.

Mr. L. C. WHARTON, M.A. (Philological Society, etc.) referring to the last paragraph but one of Dr. de Vos' Paper, called attention to the fact that the International Congress of Librarians had a representative of the Institute—Dr. Halecki—on the Committee named, while the Committee itself was represented at the Institute and kept in touch with the Commission through M. Henriot.

The Congress had given support both to the section of Scientific Relations and other aspects of the Commission's work. Mr. Wharton added that the establishment of a permanent organization depended on the support both of the Commission and of the Institute.

Mr. PERCY COHEN (Conservative and Unionist Central Office) suggested that a useful activity of A.S.L.I.B. would be collaboration with the International Institute of Intellectual Co-operation in obtaining information regarding books published abroad of interest to constituent members of this Association. Further, that publications of interest to Special Libraries and Information Bureaux should be brought periodically to the notice of the body concerned. He hoped that exploration of the possibility of co-operation would be taken up.

Dr. J. E. de VOS VAN STEENWIJK said his view on a point of importance had been asked; it was whether the Commission and the Institute should take up suggestions for propagating existing systems of nomenclature or classification, if these proposals came only from those who were already using these systems and not from those who would have to adopt them.

He personally felt that the Commission would not have recommended the adoption of the Decimal system, if it had not been assured beforehad that a large majority in the British Empire really desired it.

Mr. ERNEST I. ROBSON, M.A. (Institute of Agricultural Engineering, Oxford), recalled the fact that he had spoken last year about the obscurity of the language used in scientific papers, and said that his chief attack had been directed against Germany. He asked whether the International Institute of Intellectual Co-operation would represent to all countries the imperative necessity for simplification in scientific language, not so much in vocabulary as in general style.

Mr. L. Stanley Jast (Manchester Public Libraries, etc.) and Mr. H. Rottenburg, M.A., M.I.E.E. (Engineering Laboratory, Cambridge University, etc.), also spoke.

A UNIVERSITY RESEARCH INTELLIGENCE SERVICE.

By W. H. DAWSON

(Universities Bureau of the British Empire).

In February last the Board of Research Studies of the University of Cambridge presented a report on the question of the publication in the *University Reporter* of short summaries of dissertations approved for research degrees. The report *(Cambridge University Reporter,* February 23, 1926) pointed out that such summaries of from 100 to 300 words in length would lead to a more general reference to, and use of, the dissertations themselves which are deposited in the University Library; "would provide a complete and readily available record of the research work accomplished in the university under the direction of the degree committees and the Board; would assist future research students both at Cambridge and elsewhere to formulate their schemes of research; and would help to prevent overlapping and the repetition of work in directions that have already been explored by previous workers."

The Universities Bureau on March 4 drew the attention of all universities of the Empire to this Cambridge report, and subsequent inquiry elicited the fact that several of them are taking action on somewhat similar lines. Thus: The Birmingham University Standing Committee on Research has under consideration a recommendation that a "Summary of Theses" approved for higher degrees be published annually, the writers of the theses being required to provide for this purpose abstracts not exceeding a specified number of words; London proposes to require an abstract not exceeding 300 words to be supplied by internal students offering theses for the M.A. and all higher degrees for which a thesis is required; Oxford expects to publish an annual collection of summaries (not exceeding 2500 words each) of D.Phil. theses; Wales has the matter under consideration and cordially approves the Cambridge recommendations (to which effect was given in Cambridge by the adoption of appropriate regulations on March 12); Glasgow approved in April a proposal that summaries of from 100 to 300 words of theses accepted for research degrees should be made available for general reference; Toronto has been considering the matter and seems to favour the publication of summaries somewhat more detailed than those prescribed by Cambridge. Wales already prints lists not merely of accepted theses but of subjects approved for research for the M.A. and Ph.D.

These developments point to the establishment of some form of co-operative university research intelligence service having aims similar to those formulated in the passage quoted from the Cambridge report, but of wider scope. The Universities Bureau has under consideration a scheme applicable in the first

instance to researches which form the subjects of theses presented and approved for research degrees of universities in the British Empire. If it should come into operation it might perhaps, later, be extended to other important research work carried out in universities. It is proposed: firstly that universities should require each candidate to submit with his thesis an abstract of the same; secondly that the abstracts should be published annually in the university's official gazette or other easily obtainable periodical; thirdly that the Universities Bureau should publish annually in the *Universities Yearbook* a general catalogue and index of titles of such theses. The parts of the scheme are not absolutely interdependent, but each part is calculated to facilitate or enhance the utility of the others.

As regards the catalogue what would be the best way of arranging the titles. Suppose a person to be examining the list to find out whether there is represented in it a field of research in which he is interested—interested for instance as a student aspiring to do a piece of research work, or as a professor charged with the duty of advising prospective researchers, or as an experienced researcher wishful to compare notes with fellow workers. Some kind of subject classification seems indicated, but I doubt whether it would be practicable to attempt anything more elaborate than a classification according to departments of study recognised as such in the larger universities. Then as regards indexing—is it possible to construct a useful index from such material as titles of research theses? Would it be useful to invite the writer of each thesis to underline in its title the word he considers most indicative of his special field and, in addition, to name other words, whether included in the title or not, up to say, three in number, as index words? Finally is the idea of publishing such a general list of titles a sound one, or should we leave it to the various technical journals and learned societies to pick out what concerns them, directly from the periodicals in which the universities severally publish their abstracts, and to publish such lists and indexes, if any, as they think fit? On any or all of these questions remarks and suggestions will be exceedingly welcome.

A survey of research in the fields of humanistic and social sciences undertaken by the American Council of Learned Societies includes within its purview the question of the publication of lists of doctoral dissertations. The question is more difficult in the United States than in this country owing to the appalling dimensions to which the records of research in that country have attained, and the rate at which they are increasing. A recently published summary of research in progress at the University of Minnesota July 1924-July 1925 covers 300 closely printed pages and includes about a thousand titles of papers already published or in the press. It is admitted that some of the studies should be described rather as expositions of existing knowledge than as original research, but the inclusion of the titles of such studies does not detract from the value of such a summary as a means of minimising wasteful duplication of

work. A university secretary with whom I was discussing the matter from this point of view remarked that the proposed lists might with advantage include titles of subjects approved for research as well as those of completed dissertations. The suggestion raises various interesting points. On the one hand its adoption might lead in some cases to fruitful and economical co-operation in research; on the other hand it might lead to something like poaching and it would be necessary therefore to give the researcher the option of vetoing the inclusion of the title of his proposed research.

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Dr. E. A. BAKER, M.A. (London University School of Librarianship), said that the proposal was an extremely valuable one, and that the benefit to Boards of Study and Academic Councils, if it were carried out, would be immense. It was always very difficult to know whether a subject suggested by a candidate for a Doctoral or other Degree had already been treated. Acquaintance with what had been done already would also be of use to examiners. The catalogue however would be of immense dimensions as the world output of theses was enormous.

Mr. B. M. HEADICAR, F.R.S.A. (London School of Economics and Political Science), asked if Mr. Dawson was aware that *Economica* published each October a complete list of approved theses in Economics and allied subjects submitted in all the Universities of the United Kingdom. He said that this was of great service not only to the seeker for information on these topics but to the unfortunate student who might find after some time spent on his thesis that it had already been covered by someone earlier in the field. He considered the list had already proved its value, although it only appeared for the first time last year.

Mr. H. Rottenburg, M.A., M.I.E.E. (Engineering Laboratory, Cambridge University, etc.), Mr. L. C. Wharton, M.A. (Philological Society, etc.), Dr. E. E. Lowe, B.Sc. (Leicester Public Libraries, Museum and Art Gallery, etc.) and Dr. R. S. Hutton (British Non-Ferrous Metals Research Association, Birmingham) also spoke.

In subsequent discussion and conversation the following further suggestions were made:—

1. Universities might instruct candidates not only as to the length of the abstracts required but also as to their character. It might for instance be laid down that the abstract should clearly specify (a) the material used and (b) the conclusions reached. Candidates differ widely in capacity for efficient abstracting and it might well be provided that the abstracts should be submitted for approval or amendment to the supervising professor, or be prepared under his guidance.

2. Universities should have the abstracts printed on one side of the paper only—the reverse side being used for advertisements—so that they could be cut out and pasted on to cards.

3. It is important that the lists should give reference to journals, etc., in which the theses (or abstracts) have been, or are about to be, published. If the writers of the theses are informed of the scheme they will be glad to co-operate for the sake of the advertisement they will gain.

4. Universities should make known under what conditions and by what procedure access can be obtained to unpublished theses. They should require at least two copies of each thesis to be deposited so that one may be available for lending.

In view of the time already occupied in discussing these two papers, it was decided to postpone Mr. P. K. Turner's paper till the Evening Session.

VISIT TO IMPERIAL FORESTRY INSTITUTE.

On Sunday afternoon members of the Conference paid a very interesting visit to the Imperial Forestry Institute, University of Oxford, on the invitation of the Director.

INFORMAL DISCUSSION.

"THE EFFECT OF BROADCASTING ON THE USE OF LIBRARIES."

During the afternoon of Sunday, another informal discussion took place, when Mr. J. C. Stobart, the Director of Education of the British Broadcasting Co., Ltd., gave an account of the new educational programme of the B.B.C. and led a discussion on "The Effect of Broadcasting on the Use of Libraries."

In the course of his remarks Mr. Stobart claimed that "listening-in," which might well have been expected to prejudice reading, had in fact stimulated the interest in books—especially in solid books. For this, he had the evidence of the leading public libraries of London showing conclusively that there had been a steady increase in the demand for the more serious kind of literature, and there was traceable a definite connection between inquiries for certain types of books and the subjects of the lectures broadcast. For example, a demand for the best books on the physics of the atom followed a course of lectures broadcast by Sir Oliver Lodge.

He also suggested that libraries should develop arrangements for helping those who desired to follow up what they had learned in broadcast lectures.

GENERAL SESSION - - Sunday evening, September 26, 1926.

Chairman:

Sir RICHARD GREGORY, D.Sc., F.Inst.P., F.R.A.S.

INTERNATIONAL LANGUAGE, IN RELATION TO ABSTRACTING AND INFORMATION BUREAUX.

By P. K. Turner, A.M.I.E.E., M.I.R.E. (Research Department, Burndept Wireless, Ltd.).

Before I actually proceed with any exposition of my subject I think it may be advisable for me to say a few words of explanation. I do not know how many of my audience have already investigated the subject of International Language; but I speak now to those who have not.

It seems to be the almost universal custom of those who have no acquaintance at all with this subject to dismiss it immediately and pity its introducer as quite mad. From any of my audience who have—consciously or subconsciously—any inclination this way, I ask, in recognition of the work involved in preparing this paper, and as a matter of kindness to myself, that they will consider attentively what I have to say; and that if I have not by then convinced them, they will argue the matter with me, either publicly here, or privately later on.

When I first thought of bringing this subject before you, I proposed to try and arrange that you should be addressed by one of the real authorities on the subject: but on second thoughts it occurred to me that perhaps an unskilled exposition by one who has been interested in A.S.L.I.B. since its first meeting might carry as much weight as a far better paper from one who is not yet well known to our Association.

The Language Difficulty.

The first point which I wish to discuss is the bearing of the language question in general on our work. Although the title of my paper mentions only Information Bureaux, I think that in this respect Special Libraries are very much in the same position. I believe that you will all agree with me in saying that a Special Library must do more than simply have on its shelves all possible information on the subject with which it deals. It must be prepared to take active steps to bring this information before its users; and thus it becomes an information bureau. Both alike, if technical, *must* draw their information from a world-wide selection of technical books and periodicals; if literary, they will almost certainly be concerned with literary work in languages other than English.

Both therefore must be concerned with translation; and in both cases translation is peculiarly difficult. In the case of literary work it is admitted by all that there are certain works that cannot be satisfactorily translated, namely those of which the literary merit consists largely in *form*. There are, on the other hand, many—

probably the majority—in which the matter is of such interest that they are and should be translated even though some of their beauty of form is lost: the difficult task of the translator is to convert every shade of thought not into the *same* shade of thought in another language but into the *corresponding* shade of thought as evolved by the brains of men of another race—a distinction often neglected.

Concerning technical work, there is the obvious difficulty that while the utmost precision is needed this precision can only be got by employing as translator a person with the following qualifications:—

(1) Complete acquaintance with the idioms of both languages.
(2) Accurate knowledge of the technical terms of both languages (as far as concerns his subject).
(3) Mastery of the subject itself.

Now the combination of these three qualifications is extremely rare, for it is typical of the man who has gained a real mastery of a technical subject that he has been much too busy doing so to have had the chance of becoming really expert in both the idiom and the technical vocabulary of languages other than his own. He probably knows enough of one or two languages to struggle through technical articles; but that is a very different thing from what is required.

Later I shall try to establish the proposition that such difficulties can be much lessened by an international language: I am at present merely calling attention to the fact that these difficulties exist and are acute.

It is a curious fact that although the idea of an international language as such is often received with suspicion, there are no less than four *partial* international languages with which you are all more or less familiar.

The Dewey Classification on the one hand and Mathematical, Chemical, and Musical notations on the other are all international languages of a sort. What would be the feelings of any musical listener among my audience who had to learn six different notations to play Elgar, Debussy, Puccini, Wagner, Liszt, and Tchaikowsky? Or those of a mathematician who found that Einstein—in addition to elaborating a new hypothesis—used an entirely different set of signs instead of our 1 to 9 and $+$, $-$, $\times$, and $\div$? I believe that it will not be many years before we shall look back with equal amazement at present-day chaos. Do not misunderstand me: I neither prophesy nor hope for the disappearance of the beautiful English language—nor of any others—but I suggest that, just as some of us write in shorthand for special purposes, so we shall use a *Lingua Franca* of some kind for all matters of international interest.

I put forward as my first conclusion:—

THAT THE LANGUAGE DIFFICULTY IS A SERIOUS HINDRANCE TO THE DISSEMINATION OF INFORMATION, AND INJURIOUSLY AFFECTS THE WORK OF SPECIAL LIBRARIES AND INFORMATION BUREAUX.

How could we use an International Language.

Let us assume for a moment that a suitable medium has been found. Later I am going to discuss what is available: but at present let us postulate that a satisfactory International Language, X, is in existence.

What steps should be taken to make use of it? Obviously, the simplest of all methods in the long run is for a working knowledge of X to be part of the education of everyone interested in affairs of international importance—which elastic term includes naturally *all* scientific, artistic, commercial, or (in the widest sense) political workers. Then all the important writings of such people will be done in X; all journals of widespread circulation and serious interest will be published in X, and all international conferences will be conducted in X.

But that is not yet. In the meantime, something can be done on less heroic lines. For example it would be an immediately practical proposition—here I speak from actual personal experience—for any technical journal to give two or three pages in each issue to abstracts, written in X, of articles in its previous issue. If it had an " X-ist " on its staff, it could be more up-to-date and abstract its *current* issue in X. This works in two useful ways. Firstly, any foreign reader who is an X-ist can judge which articles are important enough to him to justify the expense of translating in full; secondly, if several papers dealing with the same technique in different countries do the same, and if (as is almost invariably the case) they exchange copies; then each of them can quite easily publish in its own language abstracts of the important contributions in all the others, and this without the considerable difficulty and expense incurred at present in getting such abstracts prepared from the foreign originals.

Further, if the X-ists are well-organized and the language is a satisfactory one, the translation of important articles in full, for those who need them, becomes simple. It is an astonishing fact that in many cases there are reasons why it would be simpler to translate from A into X and thence into B, than to translate from A into B direct.

There are many other uses which I have not time to expound in detail—they are in fact obvious—and I therefore set out as my second conclusion:—

> That a satisfactory international language would be of great advantage to the work of Special Libraries and Information Bureaux.

Is X possible?

What then must be the characteristics of X, if it is to fulfil its purpose? *First*, it must be easy to learn. By this I do not mean rather less difficult than French to an Englishman, taking perhaps five years to learn instead of ten: but *incomparably* easier. Subject to the views of others I should suggest that one must be able to read it in a week, write it in a month, and speak it in a year, all of part-time study; otherwise it simply will not be used. *Second*, it must be capable of great precision when required—but yet, if it is to be popular, it must be possible to use it with less

precision at higher speed, as we see (on comparing the language of science or law with that of casual conversation) is the case in English. *Third*, its vocabulary must be expansible to cope with the continual arising of new concepts as our knowledge increases.

Contrasted with these requirements, there are three general types of language which might conceivably be used :—

(a) *A dead language revived.*

We all know that in the Middle Ages Latin was in fact an international language for Western Europe, and it has been frequently suggested that it should be revived anew, with an extended vocabulary. The fatal difficulty is—just that : difficulty ! We must remember that 800 years ago the few people who held conference with those of other lands were the most highly educated of each country ; philosophers of leisure whose education—without any technical studies—took decades to complete. None of the dead languages is easy enough in its original form. They might be simplified ; but this is a different matter, discussed under (c) below.

(b) *A selected modern language.*

This is the suggestion almost invariably made in this country when the subject is brought up : "English is already spoken everywhere—why should anyone bother to speak anything else?" Unfortunately, this is exactly offset by a remark I heard in Paris a year or two ago: " Why, French is already the international language of all cultured people!"

Seriously, the selection of an existing national language is absolutely impracticable ; the other nations simply could not afford to let it be done. Besides, there is the question of difficulty again : it takes at least five years to be really at home in any language likely to be selected.

(c) *A language made for the purpose.*

This remains as the last alternative. It has none of the obvious objections of the others ; there is simply the main question of whether it is possible to invent such a language and make it comply with the requirements already set forth.

Some of you may be surprised when I inform you that two or three hundred different alleged solutions of the problem have been put forward, from about A.D. 1650 onwards.

It can be stated at once that quite a number of the modern ones do or could actually fulfil our requirements.

Broadly speaking, the way in which these languages are made easy is as follows :—*Firstly*, the grammar is reduced to the simplest possible terms. Only a philologist knows to what extent the many rules of existing grammar are conventional and unnecessary. Think, for example, of giving every noun a gender, quite unrelated to the sex or " neuter-ness" of the object it represents ! Yet most languages do this. *Secondly*, what rules there are have no exceptions—irregular verbs are unknown. *Thirdly*, the spelling is phonetic. *Fourthly*, the vocabulary is built up from comparatively few roots ; suffixes and prefixes give the related words. Thus from one root meaning " to write " one can, by adding standard affixes, obtain :—writing (the action), writing (the result), a professional writer, a thing to write with, a place for writing in, etc.,

etc. Thus with 1,000 roots and 20 suffixes one has 20,000 possible words by simple combinations only, of which in all probability at least 15,000 would be useful words, frequently written. Naturally, one need not remember all these: they are made by rule as and when needed, and instantly analysed by the listener—thus, to take a single example from one of these languages, if someone is described to me as (to take an excessively long word such as would seldom be used) a "skribademulo," I should at once mentally say,

skrib-	writing
-ad-	persistent action of
-em-	inclined towards, fond of
-ul-	person who is
-o	(noun ending)

"One who *will* go on writing."

The languages of this nature in existence at present are of two main types: those which are essentially simplified Latin; and those in which the roots are drawn from several sources—Romance, Teutonic, and Slav, as seems best for each individual root—and whose few rules of grammar are selected in the same way from various sources. It is, I think, a logical inference that the latter type is likely to be the easier and more satisfactory if proper advantage is taken of the scope for selection. The latter type are mostly variants of one language known as Esperanto.

I am now going to set forth a third conclusion, but I am not certain whether the above extremely short sketch—all I have time for—of the method of evolving such languages has been sufficient to convince you of their really satisfactory nature. Plenty more evidence is available if there were time to give it. The conclusion is:—

THAT AN ARTIFICIAL LANGUAGE OF THE MORE GENERAL TYPE OFFERS THE BEST PROSPECT OF FULFILLING OUR REQUIREMENTS.

ESPERANTO.

An important point, in attempting to select one from among the many suggested languages of this type, is the extent to which the language has been actually developed. Thus, suppose Y to be somewhat better than X—suppose it needs 5% less effort to learn and use it; but suppose that X is already in use by 50,000 people and Y by only 500, obviously X is the more practical proposition.

This is an extreme and easy case; but there might be quite a difficult decision to make. Luckily, in actual practice, the choice is fairly easy. There is no doubt whatever that the original Esperanto is in much greater use than any of its rivals, and it is doubtful whether any of those rivals have any real compensating advantages from the practical point of view.

Esperanto was invented by Ludwig Lazarus Zamenhof, a Jewish oculist living in Warsaw. He was born in 1859, and first published his scheme in 1887. He refused all profit or rights of ownership, and died in 1917, beloved and mourned by tens of thousands who have made use of his invention. In 1905 for the first time an International Congress of Speakers of Esperanto was held, and proved beyond doubt that speech between people of different nations, with Esperanto as their sole means of communication, was completely successful. Annual Congresses have been

held ever since, except during the war, the best attendance up to date being some 4,000 or more. As a result of these Congresses a "Language Committee" was set up, representing speakers of Esperanto in 28 countries, to exercise a general "watching brief" over the growth and development of the language.

To-day it is practically impossible to estimate the number of users of the language; but there are over 4,000 books in Esperanto. and more than 90 periodicals, including two in Braille for the blind. Their circulations, individually, vary from two or three hundred up to tens of thousands. There are about 10,000 members of the "U.E.A.," an organisation which specialises in mutual assistance between its members in various countries. It publishes a list of about 1,600 towns in the world having Esperanto "consuls" willing to assist all Esperantist visitors. Between 20 and 30 broadcasting stations in Europe regularly give Esperanto lessons and programs. Personally, I estimate the total users of Esperanto—including "occasional" users—at somewhere between 200,000 and 500,000.

Perhaps the most surprising thing of all is that, although it is language reduced to its simplest terms, it is not a mere formula. but has a quite individual style and swing of its own. It has all the desiderata I mentioned earlier, and in addition that of sounding quite well when spoken.

I give a short sample:—

La Celo de A.S.L.I.B.

La Asocio celas:—ekzameni, kuragigi, kaj kunordigi la agadon de Fako-bibliotekoj, Informejoj, kaj similaj institucioj; esti likvidejo por ties servoj; disvolvi la utilecon kaj efikecon de fakobibliotekoj kaj informejoj sub kiu ajn titolo; kaj generale helpi, per konferencoj, kunvenoj, au alimaniere, al la pli vasta diskonigo kaj sistema uzo de eldonita informo.

La Asocio celos helpi membron, kiu deziras informon iuspecan, rilatigi kun la Biblioteko au alia institucio, kiu specialas pri la temo: gi ne provos mem formi centran organizon por provizi la detalan informon senpere.

La Asocio provos starigi la principon de libera intersango de nekonfidenca informo.

The Aims of A.S.L.I.B.

The objects of the Association are:—to examine, foster and coordinate the activities of special libraries, information bureaux, and similar services; to act as a clearing house for these services; to develop the usefulness and efficiency of special libraries and information bureaux under whatever titles they may function; and generally to promote, whether by conferences, meetings or other means, the wider dissemination and the systematic use of published information.

The Association will aim at assisting members who desire information of any kind to get into touch with the appropriate library or other body specialising on the subject; it will not itself attempt to build up any centralised organisation to provide the detailed information direct.

It will be the endeavour of the Association to establish the principle of free interchange of nonconfidential information.

In conclusion, let me repeat that I shall be delighted to answer any questions on this subject either now or privately later on.

I propose no formal resolution; but my own opinion is that this Association should give some formal expression of its views, if only by the appointment of a sub-committee to investigate the question. My last conclusion, as you will have guessed, is this:-

THAT THE USE OF ESPERANTO WOULD BE OF ADVANTAGE TO MEMBERS OF A.S.L.I.B.

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Mr. H. ROTTENBURG, M.A., M.I.E.E. (Engineering Laboratory, Cambridge University), pointed out with regard to the learning of Esperanto, that in preparation for the International Esperanto Congress in Cambridge, about 1906, the police force were taught Esperanto and no difficulty seemed to have been encountered. He said that we had to admit either that there was a need or there was not a need for an auxiliary international language; those who opposed Esperanto, if they admitted the first alternative, must put forward something in its place. He considered that the real trouble was that so many could get through their daily work without feeling the necessity of Esperanto, and were, therefore, unwilling to bother about anything of the sort.

Mr. L. C. WHARTON, M.A. (Philological Society, etc.), referred to the fast that *The Star* by Mr. H. G. Wells was partially translated into Esperanto, and teaching of Esperanto with this book was tried in the London Elementary Schools and the result reported to the Esperanto Educational Association. The position of Ido, however, was much stronger than seemed to be realized.

He also mentioned that The Russian and Scandanavian and other Academies published summaries of their articles in English, French or German in international Bulletins or in other ways.

Mr. M. C. BUTLER, L.R.A.M. (British Esperanto Association Inc.), in reply to questions on Esperanto as a school subject stated that in the Canton of Geneva Esperanto was taught in the schools as an obligatory subject when a certain standard had been reached; and that in many countries Esperanto was officially recognized as an optional subject for the school curriculum. The League of Nations had adopted a very favourable report on the teaching of Esperanto in the schools of various countries, including England. Esperanto had been proved to be beneficial to the study both of English and of other languages.

With regard to other international language schemes, of which many existed on paper, they imitated Esperanto, but could not be considered serious rivals as they lacked stability and literature.

Mr. Butler also gave various facts as to the recent progress of Esperanto, taken from a speech which he had broadcast from Daventry.

Mr. L. Stanley Jast (Manchester Public Libraries, etc.), Mr. B. M. Headicar, F.R.S.A. (London School of Economics and Political Science), and Mr. Percy Cohen (Conservative and Unionist Central Office) also spoke.

The CHAIRMAN, in closing the discussion on this paper, said that in this international age everything should be encouraged that would help people to communicate freely. As Mr. Turner's conclusion to his paper was:—

> That the use of Esperanto would be of advantage to Members of A.S.L.I.B.

he invited the assembly to express an opinion on a show of hands:

26 concurred with the suggestion, and 10 declared against.

A NATIONAL INTELLIGENCE SERVICE.

By J. G. Pearce, B.Sc., M.I.E.E.
(Director, British Cast Iron Research Association).

The idea of a national intelligence service is by no means new; it has been visualised in varying forms to meet varying needs on several occasions. Thus, at the last Conference, arising out of the discussion on the *World List of Scientific Periodicals*, Dr. Chalmers Mitchell suggested a central scientific library purely for abstracting and indexing purposes. At the present time developments are taking place at the Science Library, South Kensington, which will no doubt make this fine library a national centre at any rate for the pure sciences. In a discussion in 1918, Mr. Michael Longridge suggested as a preferable alternative to a central collection of books, a college of librarians—an idea with which we are very familiar, since we stress in special library work the trained staff rather than the material.

Abroad, an actual approach to the ideal of a central establishment has been made in L'Institut International de Bibliographie, Brussels, so ably treated at the last Conference by M. Paul Otlet. For many years a related establishment was conducted in Paris, and the idea of a centre in Paris has recently been revived. M. Otlet envisages a world centre which shall function both as clearing-house and depository. There is a strong connection between the Brussels organisation and the League of Nations Committee on intellectual co-operation. The late Dr. Herbert Field established at Zürich an international intelligence centre for the medical and biological sciences, the Concilium Bibliographicum. It is important to note that there is no central body of the Brussels type in the United States; any objection to centralised schemes on grounds of cost would carry less weight there than here. The National Research Council functions as a clearing-house, but not as a mere depository. There is a Public Affairs Information Service designed for providing economic and general information, apparently through the co-operative effort of a number of librarians.

Objections to completely centralised international schemes apply also to similar national schemes. The difficulties involved are different in degree but not in kind. Objections to both types may therefore be considered together, particularly as a truly international scheme is not likely to arrive unless fostered by similar schemes national in scope. There are two main objections in English eyes to all completely centralised international schemes of the Brussels type. In the first place the cost both for capital expenditure and running expenses is enormous; in the second place there is a strong feeling that centralisation on a large scale defeats the object in view, which is ready availability of material to the inquirer. The organisation required is more cumbrous than that necessitated by a specialised institution. This interposes obstacles between the inquirer and the object of his quest and the senior staff must inevitably become rather remote from the inquirer. There is also a feeling that a physically isolated

Institute is rather in the air; that even a specialised Institute should have some connection with the other bodies concerned with the same and related branches of knowledge. Finally, the English people has a genius for making use of existing machinery where it can be adapted to suit new needs. We are temperamentally more suited to a state of affairs in which local initiative and responsibility are co-ordinated through, rather than supervised by, a central authority. We feel no compelling necessity for any sort of institution for intelligence which would correspond with the copyright library, for it is even more important for an intelligence organisation to have the power to reject material than to accept it. Such a view does not of course question the value and importance of the copyright libraries; rather does it acknowledge these.

For all these reasons the idea of a centralised, and hence a geographically-limited establishment forming the headquarters of a national intelligence service does not find much favour; we are therefore driven back to the idea of decentralisation. When we recall that throughout the country there are several hundred special libraries and information bureaux, each of which is as complete in its field if not more complete than could be the corresponding section of any national institution, we recognise that a central institution is not only unnecessary but superfluous. The ends in view can be achieved by voluntary co-operation between these agencies. I suggest that this co-operation can be made effective through, (and group action where necessary can properly be taken by), the body which has been called into existence as the Association of Special Libraries and Information Bureaux.

A tremendous asset possessed by many special libraries and other existing agencies is that they are in charge of a trained officer. Many of these establishments are public in character by virtue of their foundation; many are private or institutional, and of such a character that the controlling authority has discretion with regard to applications from outside inquirers. Such authorities frequently do not object to providing bona fide inquirers with the information they ask in order to assist in creating the free interchange of public material. The means of inter-communication exist in A.S.L.I.B. and the Directory which A.S.L.I.B. will produce, but A.S.L.I.B. would resemble a telephone exchange inasmuch as it would not, having established the communication, be a further party to their correspondence. Thus its staff and resources would be kept down to a minimum. Such a scheme is possible because its cost is reasonably small, but it is more than merely possible for it covers all that can reasonably be required.

Difficulties of course exist in the way of realising such an ideal. Considerable delay may be experienced in securing the voluntary co-operation of many of the most important agencies, especially the more conservative institutions which rightly regard their resources as held for the exclusive benefit of their supporters. In any case no member of A.S.L.I.B. would be committed to any prescribed course of action. I venture to think, however, that these difficulties, which appeared formidable two years ago, have been marvellously dissipated by the remarkable response to the

idea and possibility of an Association of this character. There is going to be in addition very considerable difficulty in determining to what extent a bona fide inquirer may be assisted. Would a Work's library, for instance, care to supply information to anyone connected with a competitor? Would a Government Department care to supply information to a foreigner? We must bear in mind all the time however that nothing is contemplated other than the interchange of public information which is available in the long run to anybody, and to make effective contact so often now lacking between the information and its user or potential user. Our Association is merely a machine whereby such availability may be made as immediate as possible, that is whereby the long run may be brief.

Further questions arise in the relationship to the scheme of such bodies as the Central Library for Students, suggestions as to which have already been made by Lt.-Colonel Newcombe, of such schemes as the *World List of Scientific Periodicals* and the *Subject Index to Periodicals*, but it is felt that with the spirit of mutual accommodation which has been shown by our successive Conferences and by the ever-widening interest in the objects we have in view, a scheme can ultimately be worked out.

If, however, A.S.L.I.B. itself is not to become a repository, and if it is to take no part in the interchange of information other than that of putting the inquirer into touch with the available resources, the question arises—what specific tasks can A.S.L.I.B. perform? Surely it should operate by functional rather than by subject divisions; A.S.L.I.B. has no place in bringing into touch people engaged in the same branch of activity; the banker or the physicist will not need to come to A.S.L.I.B. in order to meet his professional friends, for that is done more effectively by other bodies. A.S.L.I.B. provides a meeting place for people in different spheres of activity who yet have many problems in common, and the functions which A.S.L.I.B. can undertake are those which arise out of people in different spheres of activity having somewhat similar problems to face. A.S.L.I.B. for instance might sponsor a series of local committees for the co-ordination of local library resources. Need a man travel to London to see a journal taken at the library of the local civic University? Need the only foreign periodical dealing with a staple local industry which is taken in a city be available at three centres therein? A.S.L.I.B. can seek to encourage the formation of the special library and information bureau, which in any organisation often means nothing more than bringing together the available sources into one place and putting them into the charge of a skilled officer. It can afford such officers opportunities for mutual discussion and interchange of ideas with a view to the improvement of the efficiency of their departments. It can provide a platform whereby broad policies with regard to bibliography, indexing, cataloguing, abstracting, forecasting and so on may be studied and consistently solved. Thus pressure might be brought to bear on universities to provide instruction in the technique of bibliography, arrangements considered whereby overlapping in abstracting and translation may be avoided, etc.

In addition to these things it can act as a central agency undertaking such duties as may be referred to it either for economic or national reasons. These and the above may be summarised as:

1. The completion of the Directory, already in progress, and the maintenance of an up-to-date card file of centres of information properly grouped with regard to subject, territorial and alphabetical divisions.
2. It can assist in the vexed question of standardising the size, frequency of appearance and other details of publications which concern the bibliographer.
3. It can assist in the formulation of a definite policy with regard to abstracting and diminish overlapping and foster co-operation between abstracting agencies.
4. It can formulate and recommend suitable systems of classification, indexing and filing suitable for specialised information bureaux and libraries.
5. It might act as a central body for the acquisition of foreign literature and deal with difficulties arising in connection therewith which can only be settled by group pressure.
6. It might formulate approved registers of experts in various branches of knowledge and other specialists.
7. It might formulate a register of approved translators for particular languages with a view to co-ordinating the demands of various institutions and bodies for foreign translations. The money spent to-day on translations, if organised, would probably serve to cover a much wider field.
8. It might act as a clearing-house for back parts or sets of technical periodicals which are now often destroyed as of little or no market value.
9. It can co-operate fruitfully with the great organs of distribution of information in the press.

Perhaps these suggestions, amplified and enlarged in the discussion, may serve as a basis for activities at future conferences. I should regret to convey the impression that development should be on any rigid line. Requirements are so various that it might be safely hazarded that almost any carefully thought out experiment would stand justified. But to meet obvious needs with limited resources a scheme of co-operative action of the above character would appear to be the only course, and any centralized scheme is beyond our resources. To apply a final test, do we feel the same urge to establish a national intelligence centre as we feel to establish a specialized one in any works or institution? The writer suggests that the question can only be answered in the negative, and the problem of a national intelligence service must be solved in another way.

Dr. HUTTON, in giving a résumé of the paper mentioned that Mr. Pearce was largely responsible for the formation of this organization that that his paper formed a platform on which to base a discussion on the whole policy of A.S.L.I.B.

Dr. DE VOS VAN STEENWIJK (League of Nations: International Institute of Intellectual Co-operation, Paris) expressed his admiration for the programme set out in Mr. Pearce's paper and his hearty approval of the statement contained therein that a truly international scheme is not likely to arrive unless fostered by similar schemes national in scope.

Mr. B. M. Headicar F.R.S.A. (London School of Economics and Political Science) also spoke.

Dr. Hutton then took the Chair to receive the Reports from the Chairmen of the three Sectional Meetings.

Mr. BARBOUR gave the following Report as Chairman of Sectional Meeting 1 :—

At the meeting of Section 1 which was held on Saturday morning, a summary of Mr. Kaiser's paper was read by the Chairman. The discussion was initiated by Mr. P. K. Turner (Burndept Wireless Ltd.), who, as the result of experience with various methods of indexing information, was of the opinion that the best results would be obtained by the extension of a classification scheme like that of Dewey. He also criticized various statements appearing in the paper.

Mr. Borlase Matthews, who followed, thought that the Kaiser system was more suitable for general libraries than for smaller special libraries where automatic indexing without the preparation of any cards was essential. At this point the Chairman gave an account of the experience of Nobel's Explosives Co. Ltd. with the system, and drew attention to the fact that it had given highly satisfactory results for a period of fourteen years. Major E. L. Sellars of Messrs. Brunner, Mond & Co. Ltd. gave an account of the experience of his firm. He stated that the Kaiser system had given great satisfaction during the last ten years in the handling of their confidential, scientific and technical reports, and that it was being applied now in their Engineering Department.

Colonel Sir Frederick Nathan (Department of Scientific and Industrial Research) described the circumstances which led to its adoption at Ardeer Factory, and mentioned that it had proved extremely useful to him in his work in the Department of Scientific and Industrial Research. He suggested that, in view of the fact that it was desirable to take such steps as would conduce to dissemination of information on an international basis, the considered opinion of a representative body should be obtained regarding the procedure which would be best adapted to secure the development of an international scheme and suggested in outline an organisation which might prove suitable for the purpose.

Mr. Jast (Manchester Public Libraries) expressed his dissent from Mr. Kaiser's conclusions regarding the possibility of improving on Dewey or the Library of Congress schemes by manipulating terms. Classifications which were to be of any use were not arrangements of terms but of literary material, and of terms only inasmuch as they bore on literary material.

Dr. Withers (British Cotton Industry Research Association) explained the procedure which he had been led to adopt in applying the Kaiser scheme to the work of his Association.

Mrs. Cook (Independent Labout Party Information Committee) pointed out that some confusion seemed to have arisen. Mr. Kaiser seemed to her to be dealing with material already generally classified and to be more concerned with indexing so that the content of library shelves or files might be instantly apprehended. The criticism seemed to assume that an alphabetical index means an alphabetical classification.

Dr. Lowe (Leicester Public Libraries) agreed with Mrs. Cook that two distinct subjects had been confused in the discussion: (1) Classification. (2) Indexing. No librarian who had arranged his books, pamphlets and reports on a classified system such as Dewey's would ever go back to an arbitrary alphabetical or numerical method. He stated that experience showed that all classified systems required to be supplemented

by an alphabetical index, in order to secure that all existing information should be brought to the notice of the inquirer. He suggested, therefore, that it was a question of deciding which system of indexing was the ideal one.

Mr. Butler (British Esperanto Association Incorporated) thought that adoption of the Kaiser system would involve difficulties in co-ordination of effort with other libraries. Again, arrangement of books on shelves by alphabet or by accession was involved in the system and this means numerous places for all the material to be consulted on one subject. A numerical system on a subject basis, like that of Dewey, was applicable universally, and to all languages and was therefore best for purposes of International collaboration.

Mr. Rottenburg (Engineering Laboratory, Cambridge University) was of the opinion that a central national index should be developed in which duplicated cards from the indexes of different organisations in the country could be brought together.

Mr. Turner moved a resolution that at the General Meeting of the Conference on Sunday evening, it be suggested that a Committee be appointed to examine and report on the relative merits of various systems of indexing and classification. This was seconded by Mr. Rottenburg, who also mentioned the desirability of obtaining the definition of various terms. It was pointed out by Mr. L. C. Wharton (Philological Society, etc.), that the question of library terminology was being dealt with by the Second Committee set up by the International Congress of Librarians at Prague.

Mr. Jast opposed the resolution on the ground that it was futile to expect in a reasonable time an authoritative announcement on a subject capable of yielding divergent conclusions, the relative values of which it would be impossible to assess owing to the number of variable factors involved.

The Resolution on being put to the Meeting was carried by the narrow majority of one, the voting being 14 for and 13 against.

Mr. Sproxton (British Xylonite Co., Ltd.) and Miss Ferguson also contributed to the discussion.

Mr. Rottenburg then described some New Devices useful in indexing. The devices are dealt with briefly in the printed paper, but all present were glad to have the opportunity of seeing Mr. Rottenburg's exhibits and of hearing his suggestions regarding possible spheres of application.

The Meeting closed after Mr. Rottenburg's demonstration had been given.

At the meeting of Section 1 which was held on Saturday evening, Mr. W. C. Berwick Sayers, F.L.A. (Chief Librarian, Croydon Public Libraries) spoke on "Systems of Classification, with particular reference to those used in Special Libraries." His speech is represented in summary form by his printed paper. In his opinion the system of classification best adapted for use in Special Libraries is the "Extended Dewey" system.

Mr. Headicar held that the Dewey system was not the best for that purpose and stated that the Library of the London School of Economics is being reorganized on the basis of the Library of Congress scheme. He mentioned that in some of the large German Libraries which he had visited recently there was no subject classification of books on shelves.

Mr. Jast asked whether or not the public had access to the books thus treated and suggested that the feasibility of such a scheme depended largely on the procedure in this matter. Mr. Jast preferred the Dewey scheme on account of its superior notation, but recommended certain minor modifications in its application; for example, the number of countries concerned with cotton-growing was small, and the Dewey figures in this and in similar cases would prove cumbersome. He was also of the opinion that there was no evil inherent in the modification of schemes by Special Libraries to suit their individual requirements.

Mr. Headicar in replying to Mr. Jast's inquiry stated that in the German libraries mentioned, the public had not general access to the books.

Mr. Turner suggested that co-operation was desirable with regard to extensions of the Dewey system to special subjects. He suggested that the Library Association should appoint a Standing Committee to deal with this matter.

Lt.-Col. L. Newcombe (Library Association, etc.) promised to bring this matter before the Council of the Library Association.

Mr. E. A. Martin (Croydon Public Libraries Committee) stated that he hoped the German system would not be adopted in this country.

In thanking Mr. Barbour for his Report, the Chairman asked the opinion of the Meeting on the following Resolution contained in that Report :—

> That a Committee be appointed to examine and report on the relative merits of the various systems of classification and indexing.

He wished to know whether in view of the small majority by which it had been passed it was the desire of the Meeting that this formal Resolution be passed or that the matter be left in abeyance.

After a short discussion it was moved by Mr. Cohen and seconded by Mr. Jast :—

> That this Report be accepted and no action to be taken on this Resolution.

Resolved accordingly.

Mr. C. R. SANDERSON then gave the following Report as Chairman of Sectional Meeting 2 :—

Mr. Sanderson said the two sessions in Section 2 had led to discussions which were of much more than average interest.

In the morning session Principal Hudson in giving the résumé of his paper advanced a plea for the better equipment of the technical student by a more extended provision of printed material; he regretted the lack of finance and of accommodation which restricted this provision, and also the lack of any regional or national organization of the existing resources.

The discussion which followed covered a wide range, but never lost contact with the main subject. As Chairman he had some hesitancy in giving only a broad view of the discussion because he was particularly anxious to avoid giving any impression that the debate was not valuable; it was extremely valuable. But despite the fact that many of the points raised and made were very useful, he did wish to suggest that they appeared to be discussing, and attempting to solve a problem, upon the very terms of which they were not agreed.

It was argued that there was already ample provision of the kind required in local public libraries; whereas other arguments in the debate presupposed that no public library was doing anything in this direction. The latter view was not only denounced as unsound, but it was claimed that many public libraries would buy anything and everything that the local technical authorities cared to suggest. From another angle it was advanced that the needs of the youthful technical student, so far as printed material was concerned, were almost capable to definite delimitation, and that the problem had, therefore, not really been diagnosed correctly.

The problem presented three aspects :—the teacher and his needs and those of his students, the works with its requirements in the way of printed material, and the library in a middle position between the other two. The debate did in fact indicate that there was some need to visualize the economic point of contact between the specialist in the shape of the

teacher, the library as the provider of books, and the works, as the "consumer" of the product of both.

A somewhat similar point emerged in the evening session. Dr. Pickles outlined the function and methods of a Scientific Library and Inquiry Service, and indicated definite work of a practical character which had been achieved. Mr. Borlase Matthews discussed the technique of recording; the methods of transferring what had been collected and recorded into material for future guidance, i.e. how to take the past and to apply it to the present so that the greatest advantage might be obtained in the future.

Again the discussion which followed was very wide, although, as before, it maintained contact with the central topics. Examples were given expressing appreciation of the work done by Information Bureaux; the difficulties of collecting material, especially material of a statistical nature, were emphasized, and the British Government Departments concerned were placed upon their defence—a defence as ably conducted as the attack had been skilfully made; emphasis was also placed on the difficulties involved in turning generalizations obtained from collected data into particularizations which would be of value to the individual. The training of specialists for Inquiry Service work came into the discussion, and details were given of the methods adopted in certain instances.

In this session (though not quite so definitely as in the morning session) the discussion again approached the question of contact between the different organizations concerned with various aspects of this work, though the approach was never more than tentative. To clear the issue it was necessary to remember that Public Commercial Libraries were already handling much of the commercial material referred to in the discussion; and that Public Technical Libraries (or Sections) were doing the same on the technical side. A good illustration of the latter was provided by Coventry where an excellent technological section was used not only by students and by craftsmen, but also by the works themselves; subsidies had indeed been provided by the works.

In concluding his report Mr. Sanderson put forward the suggestion that a useful topic for future discussion might centre round an attempt to visualize the point of contact (and even to attempt a definition of it) between the teacher and the works on the one hand and the library as the provider of printed material for both on the other.

Sir RICHARD GREGORY then gave the following Report as Chairman of Sectional Meeting 3 :—

He said that two admirable papers had been heard and had been followed by most interesting discussions.

Mr. Cooke (President of the Business Research Association) had surveyed the subject of his paper "Research as an Aid to Business Management," in a very effective way; he had emphasized the point that business judgment must be formulated on a basis of fact, and that it was essential for us to understand and develop better ways of producing wealth. In reply to a point raised by the Chairman on the application of Taylorism in the U.S.A.—the whole object of which was to make a man into the most efficient machine possible without consideration of the human element and which must necessarily result in the weaker brethren going to the wall——Mr. Cooke said that this was best answered by Henry Ford's two latest books, in which he put forward the humanitarian plea and the possibility of appropriate work being found for incapacitated and even blinded men. Another point raised by the Chairman was that excessive advertising might result in the exploitation of the public by encouraging them to spend money on worthless articles; the case of Yadil was quoted as an instance. Mr. Cooke however suggested that if advertisement and the study of sales management could do so much for a worthless article, it surely followed that men with a sound product could achieve a very notable success.

Mr. S. J. Nightingale (Metropolitan-Vickers Electrical Co., Ltd., Manchester) said that he had recently been associated with the attempts

of some big industrial concerns to get their labour organized on a psychological basis. He had found that the British workman was a very difficult factor in psychological tests owing to his suspicion of the employer's motives. He quoted one instance where a large British firm had summoned an eminent Dutch psychologist to advise regarding its reorganization on a modern basis, but the attempt had completely failed, largely owing to the attitude of the workmen. Mr. Cooke pointed out that the mere fact of a British firm employing a Dutch psychologist was an example of extraordinarily bad psychology on the part of the management.

Major L. Urwick (Messrs. Williams and Norgate, Ltd.) considered that recognition of the necessity for the application of scientific methods in business was growing—but that that recognition was only a first step. A second step was the discovery and training of men and women with research minds, and a third the creation of confidence on the part of business men. He pointed out the difficulty of relating the research mind to the business mind and the resentment sometimes felt by men in high managerial positions when their business methods were subjected to investigation by others (possibly their juniors). He considered that the only method of solving this was to train men with a scientific education to high executive positions.

In reply to the comments of Dr. Hutton (British Non-Ferrous Metals Research Association) with regard to the very small number of educated men in business, Mr. Cooke said that the tendency in this country was for educated men to go into the professions; one reason for this was the fact that they often insisted on a guarantee of security of tenure before they would join a business firm, which fact of course operated against experiment.

Mr. A. W. Burton (Department of Overseas Trade) pointed out the importance of export market research and the insufficient use made by British firms of the information available at the Department of Overseas Trade.

Mr. L. E. Bird (International Research Bureau) touched upon the question of the re-action of the retailer to the research worker and thought that the proper solution of these matters rested in the use of tact. He also mentioned the retailer's difficulty in having to stock a manufacturer's goods in large quantities and many brands in order to satisfy what might be only a potential demand. Mr. Cooke considered that the retailer had the right to ask the manufacturer to create this demand.

Mr. Leonard Hill *(Chemical Engineering and Chemical Catalogue)* referred to the difficulties of research work in the technical market. He also stated that special methods of sales organization were needed to increase our export trade with Canada, but was of opinion that these efforts were well worth while.

Mr. Jarratt (H.M. Patent Office) also contributed to the discussion.

In the absence of Mr. Harold E. Potts (Chairman of Convocation, University of Liverpool), Mr. H. Rottenburg (Engineering Laboratory, Cambridge University) gave the substance of his paper on "Instruction in Bibliographical Technique for University Students."

In the course of the discussion that followed it was pointed out that Mr. Potts' proposals would mean a revolutionary change in University teaching methods. While it was acknowledged that the use of textbooks and note-taking were still necessary owing to the examination system, it was recommended that students should be encouraged to obtain information for themselves out of the best works that exist and should receive instruction in bibliographical technique.

Dr. E. A. Baker (London University School of Librarianship considered that the methods in the lecture-room of which Mr. Potts complained were becoming obsolete, and pointed out that the aim of the lecturers at University College, London, was to stimulate the students

to do the work themselves. He called attention to a book about to be published—*The Uses of Libraries,* intended for the guidance of students.

Mr. F. Bullock (Royal College of Veterinary Surgeons) pointed out that a student is obliged to take copious notes of lectures for the purpose of passing examinations and said that to bring about Mr. Potts' ideal drastic revision of the examination system would be necessary.

Mr. D. H. Low supported Dr. Baker and denied that lecturers adopted the methods described in the paper.

Mr. L. C. Wharton (Philological Society, etc.) said he believed it was very necessary to give the student some training in bibliography as a preliminary to his studies.

Mr. J. Wilks (University College, London) considered that if the system of referring students direct to libraries were adopted, it would be useless to turn students adrift amongst the thousands of books; unless the library were more highly organized, the divisions and classification would have to be increased, which would involve additional accommodation and extra staff and expense.

Mr. R. L. Sheppard (Bureau of Hygiene and Tropical Diseases) said that the Director of the London School of Hygiene and Tropical Diseases recognized the desirability of increased instruction in bibliographical technique and had therefore arranged for the School Librarian during each Session to give demonstrations on the use of the Library.

Mr. W. S. Jarratt (H.M. Patent Office), Mr. W. L. Cooper (Bristol University) and Miss K. M. Baverstock (Medical Research Council) also took part in the discussion.

A hearty vote of thanks was moved from the Chair to the three Chairmen of the Sectional Meetings, and was carried with acclamation.

* * * * * *

The CHAIRMAN, in briefly summarizing the results of the Conference, said that at the Business Meeting held that morning, permission had been received to proceed with the draft constitution of the Association. It had been decided to incorporate the Association.

In connection with the suggestion brought forward at the first informal discussion on "The Dissemination of Information" regarding the distribution of information by means of loose-leaf data sheets, it was decided that this matter should be referred to the Council for consideration.

The following Resolutions were then put to the Meeting from the Chair :—

(1) That this Conference expresses its great appreciation of the hospitality of the Master and Fellows at Balliol College.

Carried unanimously.

(2) That the following cablegram be sent to the Conference of the American Library Association and the Special Libraries Association, both meeting at Atlantic City, October 4th to 9th :—

'Best wishes for success of Conference from Members Association Special Libraries assembled Balliol College, Oxford.'

Carried unanimously.

(3) That this meeting approves in general the suggestion contained in Lieut.-Colonel Newcombe's paper on "Intercommunication between Special Libraries," in so far as it may be practicable for the concentration in a convenient centre in London of the Headquarters of Library organizations, Information Bureaux and kindred bodies, and that the Council be authorized to take any action in this direction that it may consider desirable.

These Resolutions were proposed by the CHAIRMAN, seconded by Professor F. E. SANDBACH, M.A., Ph.D. (Association of University Teachers, etc.), and carried unanimously.

The CHAIRMAN in his concluding remarks again mentioned the necessity for increasing the Membership of the Association and gave a brief résumé of its present financial position. He drew attention to the advantages to be received from Membership, mentioning especially the Annual Conference which formed a platform for the discussion of matters of common interest to members. At each of the three conferences already held the fees charged to those attending had been very moderate in comparison with similar conferences arranged by other organizations. It would probably be necessary to give members prior consideration in future. He also pointed out that a vast amount of information would come into the hands of A.S.L.I.B. through the channels of the Directory a great proportion of which could not be printed in any book.

A vote of thanks to Mr. Keeling and his Staff for the admirable way in which the arrangements for the Conference had been carried out was proposed by Mr. B. M. HEADICAR (London School of Economics and Political Science), seconded by Mr. CHARLES E. HECHT, M.A. (Food Education Society, Inc.), and carried unanimously.

A hearty vote of thanks was proposed to the Chairman for his services and was carried with acclamation.

The proceedings then terminated.

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